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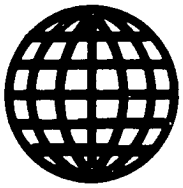

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JPRS-ULS-90-001 06 January 1990

CONTENTS

ENVIRONMENT

EPIDEMIOLOGY

GENETICS

IMMUNOLOGY

INDUSTRIAL MEDICINE

LASER BIOEFFECTS

MEDICINE

MICROBIOLOGY

NONIONIZING RADIATION EFFECTS

PHARMACOLOGY, TOXICOLOGY

PHYSIOLOGY

PUBLIC HEALTH

PSYCHOLOGY

RADIATION BIOLOGY

VETERINARY MEDICINE

VIROLOGY

CONFERENCES

MISCELLANEOUS

UDC 612.82+612.766.2

Influence of Long-Term Space Flight on Content of Specific Components in Rat Brain

18400408 Yerevan NEYROKHIMIYA in Russian
Vol 7 No 3 Jul-Sep 88 (manuscript received 20 Feb 88) pp 375-381

[Article by R. A. Tigranyan, N. N. Demin, V. Yu. Kovalev, Institute on Standardization and Testing of Medications, USSR Ministry of Public Health, Moscow; Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad]

[Abstract] A study is presented of the content of specific components in various segments of the rat brain following an 18.5-day flight aboard the Kosmos-1129 biological research satellite. Studies were performed on male Wistar rats weighing 220 g. Components studied immediately after flight, 6 days after flight and after 6 days of additional immobilization included homocarnosine, putreanine and 1-cystathionine. The greatest changes were observed in the hypothalamic area, and 6 days of readaptation to Earth's gravity only partially eliminated the changes in the medulla, cerebellum and hypothalamic area. Figure 1; References 22: 7 Russian, 15 Western.

UDC 616.281-008.1-053.8-07

Characteristics of Normal Vestibular Interaction in Adults

907C0097B Moscow VESTNIK OTORINOLARINGOLOGII in Russian
No 4, Jul-Aug 89 pp 8-13

[Article by I. A. Sklyut and S. A. Likhachev, Laboratory of Clinical Otoneurology (director—professor I. A. Sklyut), Belorussian Scientific Research Institute of Neurology, Neurosurgery and Physiotherapy (director—active member of the BSSR Academy of Sciences professor I. P. Antonov, USSR Academy of Medical Sciences), Minsk: "Characteristics of Normal Vestibular Interaction in Adults"]

[Abstract] No international standard of nystagmic reaction in healthy persons has been established as yet. A study of 25 healthy persons (14 men and 11 women) helped to determine normal parameters of visual-vestibular interaction and to establish limits of the "vestibular norm" in these people with the same visual acuity. Visual vestibular interaction was assessed by vestibular-ocular reflex parameters. Rotation with maximum rate of 10 degrees per second (stimulus 1), 30 degrees per second (stimulus 2) or 60 degrees per second (stimulus 3) stimulated the labyrinth. There was a regularity in data concerning vestibular interaction in healthy persons. Dispersion of values of the reactivity coefficient and phase shift of the vestibular-ocular reflex was minimal during rotation with fixation of visual objects while it was significant for the reactivity coefficient during sinusoidal rotation with eyes closed. Nearly total inhibition of the vestibular-ocular reflex occurred during rotation with gaze fixation on a target rotating with the chair and the reactivity coefficient was no more than 0.05. Rotation with eyes closed revealed a specific type of vestibular-ocular phase shift. Study of these indicators in clinical practice permits more basic establishment of criteria of vestibular dysfunction and greatly increases the diagnostic possibility of vestibulometry. Figures 3; 18 references: 4 Russian; 14 Western.

UDC 616.281-008.1-072.7

Change of Reflex Vestibular Activity Under Effect of Orthostatic Load

907C0097C Moscow VESTNIK OTORINOLARINGOLOGII in Russian
No 4, Jul-Aug 89 pp 16-19

[Article by A. V. Ivanov, Laboratory of Clinical Otoneurology (director—professor I. A. Sklyut), Belorussisn Scientific Research Institute of Neurology, Neurosurgery and Physiotherapy (director—active member of the BSSR Academy of Sciences, corresponding member of the USSR Academy of Medical Sciences professor Antonov), Municipal Clinical Hospital No. 10 (chief physician V. Ye. Lyakh), Minsk: "Change of Vestibular Activity Under Effect of Orthostatic Loads"]

[Abstract] The connection between cerebral hemodynamics and reactivity of the vestibular system has been little studied. These problems are of special interest for aerospace studies since full-value hemodynamics are practically basic conditions for high efficiency of an operator. A study of dizziness, disturbance of equilibrium, sudden falling and some autonomic manifestations in healthy persons in whom signs of atherosclerosis, cervical osteochondrosis, vascular hypertension were minimal helped to explain the effect of the factor of orthostasis "in pure form". An electronystagmographic study of vestibular excitability in healthy persons ranging in age from 18-33 years during active and passive orthostatic tests included 19 men. Mean values of a basic eletronystagmogram in a lying position were compared with analogous indicators recorded in active and passive orthostatic tests. Standing and tilting orthostatic tests decreased vestibular activity caused by decreases in cerebral and labyrinthine blood flow and somatic and visceral afferentation that converged on the vestibular centers of stem bulbar formations and supratentorial vestibular structures. Figure 1; references 15 (Russian).

UDC 581.132.1:632

Effects of Toxins of Fungus Bipolaris Sorokiniana (SACC) on Photochemical Activity of Wheat Chloroplasts

18400420 Moscow FIZIOLOGIYA RASTENIY in Russian Vol 36, No 1, Jan-Feb 89 (manuscript received 27 Apr 88) pp 143-149

[Article by T.Sh. Adeishvili, G.G. Simonyan, G.A. Tarabrin and Yu.N. Fadeyev (dec.), All-Union Scientific Research Institute of Agricultural Biotechnology, All-Union Academy of Agricultural Sciences imeni Lenin, Moscow]

[Abstract] In view of the fact that plant productivity may be adversely affected by various microbial factors, an assessment was conducted on effects exerted by a toxic fraction isolated from the culture filtrate of the fungus Bipolaris sorokiniana on the photochemical activity of 8-10-day-old wheat (Triticum aestivum) sprouts. The toxic fraction was shown, on the basis of EPR data, to inhibit electron transport from photosystem I (PS-I) to PS-II in chloroplast preparations. The toxic fraction also led to uncoupling of photophosphorylation, thereby diminishing synthesis of ATP, although there were no changes in light-induced pH gradient. On this basis it appears that the toxic fraction affects either the coupling factor CF_1 or the permeability of the thylakoid membrane to ions other than H^+. Incubation of the chloroplasts with various concentrations of the toxic fraction reduced photochemical activity and oxygen evolution of the isolated chloroplasts. In all major aspects the toxic fraction behaved analogously to DCMU (3-(3,4-dichlorophenyl)-1, 1-dimethylurea) and, on tentative grounds, the site of action appears to be located at the junction of PS-I and PS-II. Figures 4; references 12: 8 Russian, 4 Western.

UDC 633.11"321":631.526.32

Saratovskaya 55 Hardy Spring Wheat

18400521A Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan-Feb 89 pp 25-27

[Article by L. G. Ilina, Doctor of Agricultural Sciences, Scientific Research Institute of Agriculture of the Southeast]

[Abstract] It is difficult to develop new varieties for the dry conditions of the Southeast by simple crossing of plants with foreign materials in pairs. The varieties produced are usually inferior to varieties obtained by the use of local selection materials. In 1967, Saratovskaya 51 was crossed with Saratovskaya 29 to improve grain processing characteristics. Following double selection for grain quality, the new Saratovskaya 55 hardy wheat was developed. This moderately early variety is highly resistant to drought. First regionalized in Saratov Oblast in 1986, it was expanded to the Bashkirian ASSR in 1987 and to two additional zones in Saratov Oblast in 1988. Saratovskaya 55 is an intensive variety with good yield, reaching 39.4-42.7 cwt/ha. It requires more cultivation and earlier planting. It demonstrates that inclusion of foreign materials and materials from other regions can be used to create a variety for the dry conditions of the Southeast.

UDC 633.11"321":631.526.32

Diana 3 Soft Spring Wheat

18400521B Moscow SELEKTSIYA I SEMENOVODSTVO in Russian No 1, Jan-Feb 89 pp 27-28

[Article by M. I. Mardilovich, Candidate of Biological Sciences, Minsk Oblast Agricultural Experimental Station]

[Abstract] The Minsk Oblast Agricultural Experimental Station has introduced a new variety of wheat by individual selection from a hybrid population obtained by crossing the ecologically and genetically remote varieties Wannon (from Australia) and Leningradka. This variety of lutescens has a bald, white, cylindrical spike of moderate length and density. With a growing season of 95-115 in Belorussia, this cultivar has a genetic potential of productivity 8-9 t/ha.

UDC 631.8:633.511

Rozalin: Plant Growth Regulator

18402113A Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 1, 1989 (manuscript received 12 Jun 87) pp 16-18

[Article by A. A. Umarov, Z. I. Tsoy, A. U. Kariyev and M. Sagdullayev, Institute of Chemistry of Plant Substances, Uzbek SSR Academy of Sciences]

[Abstract] Field trials were conducted with the Soviet plant growth regulator rozalin (5-chloro-2-methylbenzimidazole) on cotton and Progressivnyy tomatoes to assess its effectiveness in terms of harvest and plant characteristics. Rozalin has been approved for use on cotton in Central Asia in 1985, as an agent that forms fine suspensions with water and is moderately toxic for mammals (LD_{50} = 600 mg/kg). The data demonstrated that treatment of the seeds with 0.001-0.005% rozalin suspensions, or spraying of the plants, was an effective means of improving the harvest and in preventing preharvest fruit drop. In the case of cotton the harvests were increased by 2.5 quintals/ha, and with tomatoes by 82-97 quintals/ha. Analysis of the tomatoes showed that they were free of residual traces of rozalin. Figures 1; references 2 (Russian).

Molecular Mechanism of Adaptation Discovered

18400489a Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Apr 89 p 4

[Article by special correspondent V. Lagovskiy: "The Difficulties of Life"]

[Text] **Another discovery in evolutionary biology made in the Botanical Institute of the USSR Academy of Sciences was entered into the USSR State Register yesterday. Its author was Doctor of Biological Sciences V. Aleksandrov.**

Why is it that living organisms easily endure the sometimes harsh conditions of the environment? How do they adapt to heat, to cold? A search for the answers to these questions is what led this scientist to a discovery. He established that one of the secrets of survival is concealed in the structure of protein molecules, in a tendency for optimization of this structure. Amino acids, even those tied together into complex, strong chains, still maintain mobility. Otherwise proteins would not be able to do their work normally. At the same time the individual links must not be "shaken up" beyond measure.

And so, it was found that as the temperature rises, the structure weakens, and when the temperature falls, it becomes more rigid. This means that living organisms adapting and striving to preserve their internal equilibrium must counteract these processes. And this is what they do: In heat, they try to strengthen the bonds between molecules, while in cold they try to weaken them.

The scientist hopes that the molecular mechanism of adaptation he has discovered will be useful to solving practical problems. For example, we could purposefully breed animals and grow varieties of plants which adapt readily to new climatic zones.

UDC 615.332:012.6

Targeted Search for Cultures Producing Ionophore Antibiotics in Streptomycetes

18400393 Moscow ANTIBIOTIKI I KHIMIOTERAPIYA in Russian Vol 33 No 12, Dec 88 (manuscript received 23 Dec 87) pp 891-895

[Article by T. N. Drobysheva, T. P. Korobkova, Yu. N. Antonenko, E. M. Singal, L. P. Ivanitskaya, T. A. Ivanova, M. K. Kudinova, N. V. Murenets, All-Union Scientific Research Institute of Antiobiotics, Moscow]

[Abstract] Polyether antibiotics are very interesting for veterinary medicine, since they are powerful anticoccidia agents and stimulate animal growth. Ionophore antibiotics are active against gram-positive bacteria and do not suppress the growth of gram-negative bacteria. This article presents a method for screening antibiotics in the culture-fluid stage by measuring potentials on the bilayer lipid membrane in the presence of a protonophore pair of Me^{n+}/nH^{+}-exchangers. The method can be used to seek both electrogenic and nonelectrogenic ionophore antibiotics, generating information on the cation selectivity of the antibiotics contained in the culture fluids studied. The method was used to find five ionophore-antibiotic producing cultures among 103 tested, three of which performed nonelectrogenic transport of cations, while two performed electrogenic transport. A new indanomycin-producing strain is described—streptomyces chromogenes strain 24/86. References 9: 4 Russian, 5 Western.

UDC 577.112.083-2.04+541.128.3+629.78

Systems of Gravity-Dependent Chemical Processes

18400394 Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 303 No 4, Dec 88 (manuscript received 14 Apr 88) pp 1004-1007

[Article by Academician A. S. Sadykov (deceased), V. B. Leontev, Yu. S. Mangutova, G. S. Nechitaylo, A. L. Mashinskiy, G. M. Grechko, Institute of Bioorganic Chemistry, Uzbek Academy of Sciences, Tashkent]

[Abstract] Minimizing gravity disturbances has a negligible influence on the rate constants and activation energies of chemical processes in liquid phase. Biochemical and electrophysical data, however, indicate that microgravitation factors have a substantial effect on human and animal bodies, which is a result of the changes produced in systems of chemical processes occurring in the cell structures of certain organs. Exothermic and endothermic chemical systems, reactions that involve phase transformations and that vary with reaction volume, may be assumed to be gravity-sensitive. In terms of identifying such phenomena and producing materials with new properties, the authors consider light-initiated copolymerization of acrylamide and bis-methylene acrylamide, with the resultant PAAG, to be promising. This article discusses the conduct of experiments involving the the production of polyacrylamide gels by means of a light-initiated reaction in a specially engineered device the Salyut-7 orbital station in 1985-1986. It also discusses the results of a comparative laboratory study of electrophysical, structural, and physicochemical properties. Studies by various physical-chemical methods and analysis of the electrophoretic resolution of the PAA gels that were produced made it possible to identify substantial differences in the structure and properties of gels obtained under different conditions. The reason for these differences appears to involve the influence of microgravitation on the nature of heat- and mass-transfer during gel polymerization. Figures 3; References 4: 3 Russian, 1 Western.

Study of Melittin-Membrane Complex by Time-Resolution Fluorescence Spectroscopy

18400470 Kiev BIOPOLIMERY I KLETKA in Russian Vol 5 No 1, Jan-Feb 89 (manuscript received 20 Jun 88), pp 100-102

[Article by A. S. Ladokhin, N. V. Lebedeva, and A. Yu. Chikishev, Institute of Biochemistry imeni A. V. Palladian, Ukrainian Academy of Sciences, Kiev; Moscow State University imeni M. V. Lomonosov]

[Abstract] Rapid progress in picosecond laser technology over the past few years allows its use in the study of rapid dynamics of biological objects. This article studies the kinetics of attenuation of the natural tryptophan fluorescence of melittin in an aqueous solution and in a complex with phospholipid membranes, establishing the existence of differences in the spectral variation of mean fluorescence time of the tetramer form of melittin in solution and melittin contained in liposomes. Figure 1; References 7: 5 Russian, 2 Western.

UDC 577.112.5:577.150.3

Amino Acid Sequences of Orientotoxins I and II Isolated From Vespa Orientalis Venom

18400418b Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 15 No 1, Jan 89 (manuscript received 25 Apr 88) pp 127-129

[Article by A.S. Korneyev, Sh.I. Salikhov and M.U. Tuychibayev, Institute of Bioorganic Chemistry, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] A comparative analysis was performed on the amino acid sequences of orientotoxin I (lysophospholipase) and orientotoxin II (phospholipase A_2) isolated from the venom of the hornet Vespa orientalis. Comparison of the amino acid sequence data for both toxins demonstrated that the polypeptide chain of orientotoxin I differed from orientotoxin II by the presence of two hydrophobic clusters at positions 64-70 and 101-108. In addition, the primary structure of both toxins differed markedly from the primary structure of phospholipase A_2 derived from bees and other sources. Figures 2; references 8: 2 Russian, 6 Western.

UDC 577.155

Influence of Ca^{2+}-Current Modulators on Passive Calcium Transport in Vesicularized Myocardial Sarcolemma Preparations

18400259b Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 89 (manuscript received 24 Oct 88), pp 79-81

[Article by G. P. Shmiger, M. D. Kurskiy, Z. D. Vorobets, and S. N. Marchenko, Institute of Biochemistry, Ukrainian Academy of Sciences, Kiev]

[Abstract] Data on the regulation of the functions of Ca^{2+}-channels of the sarcolemma are quite fragmentary and contradictory. Biochemical studies based on simpler systems than the entire cell are required to solve the problem. Vesicularized sarcolemma preparations can be useful for this purpose. This article presents a study of the influence of Ca^{2+} antagonists and agonists on passive calcium transport in vesicularized myocardial sarcolemma preparations. Entry of calcium into the vesicles was measured as a function of membrane potential. The membrane potential was created by means of a K^+-valinomycin system. Entry of calcium into the vesicles was found to be potential-dependent, most rapid at zero membrane potential (in depolarized vesicles). As the membranes were polarized, entry rate decreased. A calcium antagonist completely inhibited the potential-dependent component of Ca^{2+} transport and partially inhibited the potential-independent component as well. Calcium agonists activate passive transport of calcium in partially polarized vesicles and have no influence on transport in depolarized vesicles. Figure 1; References 15: 4 Russian, 11 Western.

UDC 535.372

First-Stage Charge-Separation Dynamics in Dimethylaniline-Mesoporphyrine Quinone Triad

18400396 Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 1, Mar 89 (manuscript received 7 Jul 88) pp 223-226

[Article by V. V. Borovkov, V. F. Kamalov, I. A. Struganova, B. N. Toleutayev, Institute of Fine Chemical Technology imeni M. V. Lomonosov, Moscow Moscow State University imeni M. V. Lomonosov]

[Abstract] Results are presented from an experimental study of the process of charge separation and electron transfer in a triad molecule consisting of a secondary donor (a derivative of dimethylaniline), a photosensitizer (mesoporphpyrine II), and an acceptor (a quinone fragment). The steady-state and kinetic characteristics of fluorescence of the triad were measured in several solvents. The results indicate that the porphyrine group of the triad exists in two forms: a neutral form and an anionic form that is generated as a result of the dark acceptance of an electron from the dimethylaniline. A process of photoinitiation of electron transfer is thus detected in a system with dark charge separation and a high rate constant, making the system promising for use in high-speed molecular electronic devices. Figures 2; References 8: 4 Russian, 4 Western.

UDC 577.3

Isolation and Properties of Cytochrome-Containing Photosynthetic Reaction Centers From Chromatophores of Chromatium Minutissimum

18400415c Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 3, Mar 89 (manuscript received 19 Jul 88) pp 732-735

[Article by Ya. Sabo, N.I. Zakharova, N.Ya. Uspenskaya, S.K. Chamorovskiy and A.A. Kononenko, Moscow State University imeni M.V. Lomonosov]

[Abstract] Technical details are presented on the isolation of cytochrome-retaining photosynthetic reaction centers from the chromatophores of the bacterium Chromatium minutissimum, in order to obtain additional such preparations to complement studies carried out thus far largely on centers prepared from Rhodopseudomonas viridis. The resultant preparation from Ch. minutissimum retained the capacity for electron transport at the cytochrome (arrow) bacteriochlorophyll 2 over + level. The reaction center consisted of 22, 25, and 30 kD subunits representing the L, M, and H triad of subunits, a 45 kD cytochrome subunit, as well as a 20- and 12-kD subunits representing breakdown products of the cytochrome complex. The yield of the photosynthetic reaction center was in excess of 60 percent and attributable to the simultaneous use of nonionic (Triton X-100) and ionic (sodium cholate) reagents, as well as sodium dithionate. Preparations of photosynthetic reaction centers obtained in this manner are felt to be potentially useful models for studies on electron tunneling. Figures 3; references 14: 3 Russian, 11 Western.

UDC 591.185.6:597.82:612.843

Microspectrophotometric Studies of Absorption Spectra of Rana Temporaria Photoreceptors

18400416 Moscow BIOLOGICHESKIYA NAUKI in Russian No 1, Jan 89 (manuscript received 28 Sep 87) pp 44-48

[Article by I.Yu. Novitskiy and P.P. Zak, Institute of Chemical Physics, USSR Academy of Sciences]

[Abstract] Microspectrophotometric studies were conducted on the photoreceptors of Rana temporaria, a frog with land-based habitation in the summer and aquatic habitation in winter. The study led to the identification of two types of rods with respective absorption maxima at 505 and 432 nm. In addition, isolated rods were identified with maxima at 512 nm. Assessment of cones showed that single cones and principal components of duplex cones contained visual pigment with an absorption maximum at about 555 nm. Accessory cones exhibited a maximum at 505 nm. The transverse optical density of rods ranged from 0.08 to 0.1, and of cones from 0.01 to 0.03. In general, the spectra that were observed corresponded to A_1 pigment nomogram, rather than to dehydroretinal nomograms. On balance, the red-sensitive cones of R. temporaria show sensitivity in the shorter wavelength band in comparison with the cones of R. pipiens and R. ridibunda. This difference may be a reflection of a largely land-based existence of R. temporaria. Figures 2; references 10: 3 Russian, 7 Western.

UDC 615.384:615.451.23].015.4:612.17].07

Effect of Oncotic Agents in Perfluorocarbon Emulsion on Isolated Heart

18400482 Moscow KHIMIKO-FARMATSEVTICHESKIY ZHURNAL in Russian Vol 23 No 1, Jan 89 (manuscript received 12 Jan 88), pp 53-56

[Article by S. I. Vorobyev, B. I. Islamov, Ye. I. Mayevskiy, S. M. Yarovaya, L. P. Grineva, G. S. Alekseyeva, T. N. Telkova, O. Yu. Popova, V. A. Dombrovskiy, Institute of Biological Physics, USSR Academy of Sciences, Pushchino; All-Union Scientific Research Institute of Blood Substitute and Hormonal Preparation Technology, Moscow]

[Abstract] Preparations based on oxyethyl starch are widely used as oncotic agents in perfluorocarbon emulsions. These agents have a volemic effect and are on a par with traditional preparations based on dextran and blood albumin. This article is dedicated to study and selection of the most suitable oncotic agent from the

physical-chemical and biological standpoints, to be used for perfusion of a heart as a part of a perfluorocarbon emulsion. The optimal agent is found to be oxyethyl starch with low molecular mass and low characteristic viscosity, good compatibility with perfluorocarbon emulsions and the ability to maintain the required colloidal-osmotic pressure. Preparations based on oxyethyl starch can be used to preserve organs in which maintenance at the normal colloidal-osmotic pressure is a factor in preventing edema and lengthening the time of preservation. References 5: 2 Russian, 3 Western.

U.S. Scientist on Black Sea Expedition Says Sea Not Radioactive

18402026b Moscow MEDITSINSKAYA GAZETA in Russian 30 Apr 89 p 4

[Article by M. Stetsyuk, Tass correspondent, Sevastopol: "How's Your Health, Black Sea?"]

[Text] A two-week expedition of USSR and U.S. scientists on the Black Sea was completed on the scientific research ship *Professor Vodyanitskiy*. Specialists in radiation and chemical biology studied the pollutions levels of the basin, selecting for this purpose the period of spring floodings on rivers, when the greatest amount of harmful substances is brought here.

Scientists of the Institute of the Biology of the Southern Seas of the Ukrainian Academy of Sciences and of the American Woods Hole Oceanographic Institution worked on board the Soviet ship. It is the first joint expedition of the two leading institutions in this field since the Chernobyl Atomic Electric Power Station accident, which happened place three years ago. The Soviet scientists are permanently monitoring the radiation situation. Their results, which are regularly published in print, give no cause for alarm. However, that does not prevent the appearance from time to time of unfounded rumors, including those about the contamination of the waters of the Black Sea.

"Is there actually radiation-contaminated water posing a threat to people's health at famous beaches?" asked the TASS correspondent of Doctor L. Hugh [Khyu], an expedition participant.

"There are no problems of any kind! The water, fish, and mollusks of the Black Sea are safe for people," said the American scientist.

UDC 632.95.028

Possible Criteria for Monitoring the Pollution of Land Biocenoses by Persistent Toxicants

18402071 Kiev VESTNIK ZOOLOGII in Russian No 1, Jan-Feb 89 (Manuscript received Jun 86) pp 33-37

[Article by O. V. Maslova, N. A. Shebunina, Institute of Zoology imeni I. I. Shmalgauzen, Ukrainian Academy of Sciences, Kiev]

[Abstract] A study is made of the relationship between accumulation of chlorinated organic pesticides migrating through ecosystems and certain physiological and biochemical changes which they cause in mouse-like rodents inhabiting agrocenoses and wildlife preserves. The physiological-biochemical test selected is an indicator of protein metabolism—the content of bone collagen, the basic fibrous protein constituent of connective and bone tissue. Chronic exposure to sublethal concentrations of toxaphene, a DDT analogue, significantly decreases the collagen protein content in the vertebrae of fish. Studies were performed on the common vole (*Microtus socialis* Pall) and the wood mouse (*Apodemus sylvaticus* L.) from spring through fall in 1984 and 1985 in agrobiocenoses and, for comparison, in wildlife preserves theoretically free of pesticides. The biocenoses studied were found to be contaminated with persistent chlorinated organic pesticides. DDT is still entering the environment, probably as result of global transfer processes. The pesticides cause protein metabolism disorders, as evidenced by the collagen content in the bones of the spial column. Figure 1; References 18: 11 Russian, 7 Western.

Azov Sea Pollution

907C0002A Moscow MEDITSINSKAYA GAZETA in Russian 28 May 89 p 2

[Article by B. Gertsenov, TASS correspondent, special for MEDITSINSKAYA GAZETA, Donetsk, under the rubric "Ecological Situation" : "And Again the Sea Is Under Lock and Key"]

[Abstract] Decades of sanitary neglect, urbanization and industrial overdevelopment have now made it necessary to forbid swimming on beaches of the Azov Sea because of dangerous levels of pollution, a situation that affects the vacation plans of workers at fifteen industrial plants in the area. Despite warnings from health authorities and efforts of the labor unions, no telling measures have been made to control waste discharge into the sea, to expand the capacity of existing waste treatment facilities, or to construct new facilities. The author suggests that the time has come for a concerted cooperative effort to save the recreational, health, and ecological resources that the Azov Sea environment represents for present and future generations.

UDC 616.12.008.331-084

Epidemiology of Arterial Hypertension and Secondary Prophylaxis in Unmanaged Rural Populations

18400409a Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 12, Dec 88 (manuscript received 9 Mar 88)pp 3-6

[Article by A. Salakhidinov and S. Yu. Tursunov, Andizhan State Medical Institute imeni M. I. Kalinin]

[Abstract] An epidemiologic analysis was carried out in two rural regions of the Andizhan Oblast to assess the effects of medical intervention vis-a-vis hypertension. In the region with intervention a total of 8,566 cases were analyzed, and in the region without active intervention 8,796 subjects were monitored. The age of the target group in both regions ranged from 18 to 59 years. In the region with active medical intervention in the form of public education and treatment, a 3-year follow-up revealed that 81.6 percent of the patients with hypertension were aware of their condition (up from 40.4 percent after a 1-year follow-up), treatment with hypotensives encompassed 65.6 percent of the individuals with hypertension (up from 44.4 percent), and effectiveness of therapy in terms of bringing diastolic readings down to below 95 mmHg increased to 34.8 percent (up from 3.1 percent). In the control region without intensive medical intervention, the corresponding parameters remained essentially unchanged over the 3-year period of observation and were equivalent to those originally seen in the group with intervention. These findings confirm the benefits of active medical intervention in the management of hypertension at the population level.

UDC 616.98:579.834.114]-022.39:576.895.42]-036.2(575.13)

Epidemiologic Status of Relapsing Fever in Central Asia: Fergana Oblast Findings

18400410c Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6, Nov-Dec 88 (manuscript received 24 Feb 88)pp 43-46

[Article by K. N. Amridinov, N. Ya. Ustimenko, L. I. Cherneva and N. F. Ofitserova, Scientific Research Institute of Medical Parasitology imeni L. M. Isayev, Uzbek SSR Ministry of Health, Samarkand; Fergana Oblast Sanitary Epidemiologic Station]

[Abstract] An epidemiologic survey was conducted on the status of relapsing fever in Fergana Oblast, Uzbek SSR, for the period 1980-1984. The general pattern of the disease indicated that the primary factors responsible for the persistence of the problem among humans are dwellings infested with rodents on which the tick feeds. Peak infection incidence is in May, and 40 percent of the cases are represented by individuals 20-29 years old. Approximately 30 percent of the patients report tick bites. The current outlook is that relapsing fever shall remain a problem in the Fergana Oblast for some time to come, because of the prevalence of a large reservoir of domestic animals and rodents. Figures 2; references 20 (Russian).

UDC 616.831-002-022.7:578.833.26]:31(571.53)

Long-Term Patterns in Tick-Borne Encephalitis Morbidity in Irkutsk Oblast

18402014d Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 12 May 87)pp 62-64

[Article by G. A. Danchinova, R. L. Naumov and V. V. Lopin, Scientific Research Institute of Epidemiology and Microbiology, RSFSR Ministry of Health; Oblast Sanitary Epidemiological Station, Irkutsk; Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow]

[Abstract] An analysis was conducted on the morbidity patterns of tick-borne encephalitis (TBE) encountered in the Irkutsk Oblast in the period 1956 to 1986. In that timeframe TBE was diagnosed in 15 rayons and one national region. A wavelike pattern of peaks and valleys in terms of incidence was observed for the Eastern Sayan region, the Upper Angara region, and Lena-Angara territory. In general, one or two major peaks were observed to occur every 20 or so years, with a series of smaller incidence peaks at 5- to 10-year intervals. Based on the official statistics that are currently available, it appears that a major outbreak of TBE is to be expected in the late 80's in the Irkutsk Oblast. However, in view of the rapid development of the oblast the anticipated pattern may be altered, requiring close monitoring for optimum preventive measures. Figures 3; references 3 (Russian).

UDC 576.895.42.095.6(470.51)

Cyclic Changes in Taiga Tick Density in Udmurtia

18402014e Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 24 Mar 88)pp 65-69

[Article by Yu. S. Korotkov, G. A. Volchkova, G. S. Kislenko, S. P. Chunikhin and L. V. Shmakov, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow; Udmurst ASSR Sanitary Epidemiologic Station, Izhevsk]

[Abstract] Autocorrelation functions were analyzed for the density of Ixodes persulcatus in Udmurt ASSR, solar activity, and climatic conditions for the period 1954 through 1986. Three different cycles became apparent for the tick population: a cycle of 5-7 years (5.5 years average) corresponding to intensity of solar activity, and cycles of 9-12 (11 years) and 19-23 (22 years) years coinciding with

changes in solar activity. On the basis of the available facts and predictions as to solar activity in the future, the prognosis is being advanced that the next upsurge in I. persulcatus population is to be expected in the period 2003-2009, with peak population density in the 2004-2006 timeframe. Figures 3; references 9 (Russian).

Cytology Institute Participates in Human Genome Research Program

18400576b Leningrad LENINGRADSKAYA PRAVDA in Russian 16 Apr 89 p 1

[Article by S. Samoylis]

[Excerpt] The USSR Academy of Sciences' Institute of Cytology is Leningrad's only academy scientific research institute whose scientists are conducting research within the framework of the state scientific program "The Human Genome." (See the *Daily SNAP*, 9 May 1989, p 3, col. 2.)

"We have been working in line with this program only since the beginning of this year, but we have long-standing traditions of cytology and cellular-biology research," related Professor N. N. Nikolskiy, director of this institute. "Professor G. P. Pinayev heads a department of cell cultures which was formed at the institute in the 1970's. One of the stages of work in line with the program 'The Human Genome' is now in progress in this department."

I visited the department with V. M. Parfenov, deputy director for science. Routine work was going on in hermetically sealed glass boxes.

"We are growing cells in artificial conditions," explained senior project science associate I. I. Fridlyanskaya. "Further studies within the framework of the program are being conducted in other laboratories of the institute."

One of them is the laboratory of cell morphology, where the structure of chromosomes is being studied. Senior project science associate S. Ye. Mamayeva, head of a group of cytogeneticists, showed us a unique computer, the "Magiscan," with programs for the study of chromosomes. It is one of two such computers in our country.

The institute has needed complex equipment for isolating individual chromosomes. It is being developed jointly with the USSR Academy of Sciences' Institute of Nuclear Physics. International contacts are also being organized.

At the institute, we made the acquaintance of senior project science associate Yu. M. Rozanov, N. V. Tomilin, V. L. Larionov, T. N. Ignatova and other active participants in the program. About half of the institute's laboratories have been put to work on this research.

(Two photographs are given showing S. Ye. Mamayeva and junior science associates D. B. Gromov and L. G. Savelyeva working at video terminals in the laboratory of cell morphology; and Yu. M. Rozanov.)

FTD/SNAP

UDC 578.52

Transcription of Human GH-RF in Transgenic Rabbit

18400415a Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 3, Mar 89 (manuscript received 8 Jul 88) pp 726-728

[Article by K.G. Gazaryan, L.Ye. Andreyeva, Ye.D. Kuznetsova, D.Kh. Khamidov, T.Yu. Koval and V.Z. Tarantul, Institute of Molecular Genetics, USSR Academy of Sciences, Moscow; Institute of Biochemistry, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] Rabbit zygotes were injected with a EcoRI/HindIII fragment of a recombinant plasmid bearing human growth hormone releasing factor (GH-RF) minigen under the control of mouse metallothionein gene promoter, and then implanted into the oviducts of receptive female rabbits. The injection parameters were calculated to yield 500 copies of the plasmid fragment per pro-nucleus. Restriction mapping and Southern blot analysis demonstrated that the DNA sequence in question was integrated into the genome of one rabbit resulting from the experiment. In addition, S_1 mapping demonstrated the transcription of the GH-RF gene in hepatic and ear lobe tissues. The weight of the female transgenic rabbit at the age of 10.5 months after 5 weeks on a diet supplemented with $ZnSO_4$ was 10 percent greater than the weight of a control female, although no evidence was obtained on whether synthesis of GF was enhanced. Figures 3; references 15: 3 Russian, 12 Western.

UDC 606-006

Expression of Escherichia Coli Glucose Isomerase Gene in Transgenic Plants

18400415b Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 3, Mar 89 (manuscript received 27 Jun 88) pp 729-731

[Article by E.S. Piruzyan, V.M. Andrianov, V.M. Yusibov and V.L. Mett, Institute of Molecular Genetics, USSR Academy of Sciences, Moscow]

[Abstract] An analysis was conducted on the expression of E. coli gene for glucose isomerase, an enzyme noted for its thermostability at 60°C, in tobacco plants made transgenic via a series of recombinant plasmids. The gene was accompanied by its own promoter and that of the nopalin synthase gene (nos) of pTiC58 plasmids of Agrobacterium tumefaciens. The leaf-disk method was used to infect Samsun tobacco plants. Southern blot hybridization was used to demonstrate integration of the DNA sequence bearing the gene into the plant genome, yielding three lines of plants with heat-stable glucose isomerase activities on the order of 0.01, 0.003, and 0.002 U/mg protein. In addition, S_1 mapping studies demonstrated transcription of the gene into the corresponding mRNA. This constitutes the first reported

demonstration of the activity of a bacterial gene in transgenic plants at the levels of transcription and translation. Figures 2; references 5: 1 Russian, 4 Western.

UDC 575.113.1:577.113:577.175.3:577.2:597.554.3:599.9

Integration and Expression of Human Growth Hormone Gene in Teleostei

18400417a Moscow GENETIKA in Russian Vol 25 No 1, Jan 89 (manuscript received 28 Mar 88) pp 24-25

[Article by A.O. Benyumov, G.N. Yenikolopov, V.A. Barmintsev, I.A. Zelenina, L.A. Sleptsova, Yu.K. Doronin, V.A.Golichenkov, M.A. Grashchuk, G.P. Georgiyev, P.M. Rubtsov, K.G. Skryabin and A.A. Bayev, Chair of Embryology, Moscow State University; Institute of Molecular Biology imeni V.A. Engelgardt, USSR Academy of Sciences, Moscow]

[Abstract] Transgenic teleosts were prepared by microinjection of recombinant plasmid pMTSV bearing DNA complementary to human growth hormone gene into fertilized loach (Misgurnus fossilis) eggs. Following injection of the plasmid 52.5-62.5 percent of the embryos hatched, vs. a figure of 72.5 percent for sham-injected controls and 90 percent of intact controls. Injection of 0.02 to 2 μg/ml DNA led to a dose-related increase in various developmental anomalies. DNA screening studies demonstrated that in 42.2 percent of the brood resulting from eggs injected with 2 μg/ml DNA the exogenous DNA was integrated into the loach genome in a multiplicity of 2 to 30 copies/genome. Activation of the human gene was achieved by maintaining the 4.5-month-old fry in 0.05 M zinc sulfate for 5.5 weeks. In addition, mRNA was isolated from the transgenic fish which was complementary to the exogenous DNA, demonstrating expression of the human growth hormone gene in the loach organism. Finally, the length of the 22.5-week-old transgenic loach (61.1 mm) and weight (1,558.0 mg) were significantly greater than the corresponding parameters of the control loach of equivalent age (52.7 mm and 1,016.9 mg). The high viability of the transgenic loach and their responsiveness to the human growth hormone confirms the ever-widening practical applicability of genetic engineering. Figures 4; references 22: 5 Russian, 17 Western.

UDC 579.25;579.253:579.835.11

Insertion Mutagenesis in Nitrogen-Fixing Bacterium Azospirillum Brasilense

18400417b Moscow GENETIKA in Russian Vol 25 No 1, Jan 89 (manuscript received 3 Dec 87) pp 36-48

[Article by I.A. Borovok and A.G. Myakinkov, All-Union Scientific Research Institute of Agricultural Biotechnology, Moscow]

[Abstract] A series of insertion mutants of the nitrogen-fixing bacterium Azospirillum brasilense were obtained using the Tn5 transposon and its congeners. Insertion of Tn5 was attained with plasmids pSUP202(pBR325-Mob_{RP4}) serving as the suicide vectors. Mutants were produced at a frequency of 10^{-8} to 10^{-6} per recipient cell (on the basis of kanamycin resistant (Km^r) cells). In addition, Tn5 was also shown to impart streptomycin resistance (Sm^r), with the frequency of Km^r/Sm^r(::Tn5) clones ranging from 0.6 to 1.3 percent, depending on the strain of A.brasilense. The mutagenic effects of Tn5 and of other transposons (Tn5-Mob, TnV) affected a number of physiological characteristics of A. brasilense, showing their utility in assessing these parameters in relation to nitrogen fixation. Furthermore, the integration of the pSUP202::Tn5-17 vectors in the bacterial genome and the presence of unique restriction sites on the vector suggests their use as endogenous cloning vectors. Figures 3; references 41: 7 Russian, 34 Western.

UDC 575.042:576.312:577.3

Mutagenic Effects of Direct Electric Current

18400417c Moscow GENETIKA in Russian Vol 25 No 1, Jan 89 (manuscript received 12 Oct 87; in final form 8 Apr 88) pp 158-160

[Article by N.N. Grigoryeva, V.G. Shakhbazov and Ye.N. Nebogatikova, Chair of Genetics and Cytology, Kharkov State University imeni A.M. Gorkiy]

[Abstract] A study was conducted on the mutagenic potential of direct current (DC) by external application of the current to root meristem of the bean Vicia faba. The specific experimental conditions consisted of an externally applied 30 μA DC for 30 min, followed by fixation and cytogenetic analysis. The results demonstrated that in cases where the anode was in contact with the root tissue the number of cells with chromosomal aberrations increased to 7.53 percent, vis-a-vis a control value of 1.72 percent, i.e., a fourfold increase. The percentage of cells with similar abnormalities when the cathode was employed for direct contact was 3.02 percent. The number of chromosomal aberrations per 100 cells in the control, anodal, and cathodal series was, respectively, 1.82, 14.55, and 4.85. This study, then, demonstrated the mutagenic potential of 30 μA DC and, in comparison with the previously reported protective effect of 3 μA DC, demonstrated the dose-dependent nature of the dual effects of DC on the genetic apparatus of plant cells. References 7: 5 Russian, 2 Western.

UDC 577.214.622/625

Construction of Promoter Probe Vectors Using Modified Escherichia Coli Beta-Galactosidase Gene

18400418a Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 15 No 1, Jan 89 (manuscript received 27 Jun 88) pp 90-103

[Article by V.A. Yefimov, O.V. Mirskikh, A.A. Buryakova, I.N. Pashkova, N.N. Polishin and O.G. Chakhmakhcheva, Institute of Bioorganic Chemistry imeni M.M. Shemyakin, USSR Academy of Sciences, Moscow]

[Abstract] Technical details are presented on the approach used in the construction of plasmid vectors—two designated as pPV4 and pPV5—for assessing the efficiency of natural and synthetic promoters. The E. coli beta-galactosidase gene (lacZ), appropriately modified at the 5'- and 3'-ends with synthetic DNA sequences (15 and 58 bp, respectively) was employed as a marker. The vectors also contained sequences encoding terminator fragments, an SD site, and a polylinker segment for the insertion of DNA sequences undergoing testing. Tabulated data are provided on the use of this system for testing the expression of the lacZ gene with various promoters, including promoter P_L of bacteriophage lambda and the promoter of the X gene of phage fd. Figures 5; references 24: 8 Russian, 16 Western.

UDC 579.852.11

Construction of Expression Vectors Using Saccharomyces Cerevisiae PHO5 and PHO3 Promoters

18400421b Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA: BIOLOGIYA in Russian
No 3, Feb 89 (manuscript received 2 Dec 87) pp 89-95

[Article by A.N. Myasnikov, K.V. Ostanin, Yu.A. Plavnik and M.N. Smirnov]

[Abstract] A series of bacterial plasmids were constructed containing yeast promoter and transcription terminator for use as expression vectors. The plasmids contained various deletion derivatives of the Saccharomyces cerevisiae PHO5 AND PHO3 promoters and the PHO5 sequence for termination of transcription, with the latter positioned in identical orientation in the various plasmids. The polylinker sequence of plasmid pUC19 was inserted between these fragments, bearing restriction sites EcoRI, SacI, KpnI, SmaI, and BamHI. The latter restriction sites were includes to facilitate the insertion of foreign genes for their eventual expression. In addition, each vector also contained restriction sites for isolation of promoter-gene-terminator segments and their recloning in shuttle plasmids. Figures 5; references 17: 2 Russian, 15 Western.

UDC 615.373:616.35-002.12/.14

Prophylactic Effectiveness of Immunoglobin Preparations with Varying Content of Antibodies Specific to the Hepatitis A Virus

18400400 Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 12, Dec 88 pp 37-39

[Article by V. S. Perepelkin, Candidate of Medical Sciences, Major General of Medical Service; A. A. Sumarokov, Professor; M. A. Gorbunov, Candidate of Medical Sciences; G. A. Tyantov and V. A. Borzykh, Lieutenant Colonels of Medical Service]

[Abstract] A comparative study of the prophylactic effectiveness of commercial series of immunoglobulin and a specific preparation reported to have antihepatitis-A titers 10-15 times higher than those of commercial series was performed under controlled conditions to improve the immunoglobulin prophylaxis tactics for use among groups of organization-affiliated individuals with high risk of infection. Over a six-month observation period, morbidity due to viral hepatitis A was 3.2-fold lower among individuals receiving the specific preparation than among those receiving placebo, and 2.9-fold lower among those receiving the commercial series than among the placebo group. No statistically significant differences were found in the prophylactic effectiveness of the commercial and specific immunoglobulins for hepatitis A. Significant differences were found in the prophylactic effectiveness of commercial immunoglobulin with antihepatitis-A titer 1:2000 and nontitered commercial immunoglobulin. Figures 1.

UDC 616.006.188-003.93:612.018

Study of Tumor Growth Reversal With Local Application of Polymer Preparation With Prolonged Immunomodulating Effect

18400459a Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR, SERIYA B: GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 89 (manuscript received 26 Aug 88), pp 56-60

[Article by N. A. Galatenko, G. A. Pkhakadze, Ye. S. Savitskaya, N. N. Bufius, Institute of Organic Chemistry, Ukrainian Academy of Sciences, Kiev]

[Abstract] Because surgical intervention cannot always remove all tumorous tissue and because the patient's immune system is sometimes too weak to provide proper healing of the postsurgical wound, medications are needed which kill tumor cells in the wound and in the surrounding tissue and can be used as alloplastic materials that strengthen regeneration at the wound site. Introduction of levamisole to polyurethane biodegradable compositions significantly activates the function of macrophage elements at implantation sites, speeds up the destruction of the polymer composition, and stimulates regeneration and histogenesis of connective tissue. This article studies the influence of polyurethane foam compositions with levamisole on tumor tissue in S-45 experimental sarcoma in rats following partial removal of the tumor and application of the prolonged-action polymer preparation to the remaining tumor tissue. The prolonged effect of levamisole results in local activation of macrophagal elements. The activated macrophages restore homeostasis in the tissue region, acting on connective-tissue cells, strengthening their proliferative activity and, therefore, regeneration processes. Proliferating fibroblastic elements in connective tissue have been shown to generate a cell-differentiation factor which causes reversion of the tumor process in combination with macrophage activity. Figures 4; References 12: 7 Russian, 5 Western.

UDC 579.843.95:[576.895.775:591.67].083.33.083.185

Detection of Plague Bacillus in Fleas by Enzyme Immunoassay and Monoclonal Antibodies

18402014b Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 2 Dec 86) pp 57-60

[Article by M. I. Levi, Ch. B. Ulukhanov and K. A. Kuznetsova, Kabardino-Balkar Antiplague Station]

[Abstract] A comparative analysis was conducted on the results obtained in testing several thousand fleas for the presence of the plague bacillus, using conventional bacteriologic methodology, passive hemagglutination serology, and enzyme immunoassay combined with monoclonal antibodies for high specificity [Levi, M. I., et al., ZHURN. MIKROBIOL., No 11:84-88, 1984]. The results demonstrated unequivocally the advantages of the solid-phase enzyme immunoassay, which yielded a positive rate of 0.47 percent for 5,070 fleas versus a positive rate of 0.14 percent per 22,938 fleas for the bacteriologic method. The strength of the monoclonal antibody-based system lies in its sensitivity and applicability to the study of individual fleas. References 6 (Russian).

UDC 616.5-002.022.7-057:[614.89-078

Evaluating Fabrics and Materials for Special Clothing That Protects Against Microorganisms

18400484a Moscow GIGIYENA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 1, Jan 89 pp 46-47

[Article by V. L. Molkova, V. N. Artemyev, and M. V. Kibitkina, All-Union Labor Safety Scientific Research Institute, All-Union Central Council of Trade Unions, Ivanovo]

[Text] A significant number of production processes and jobs are accompanied by a high level of bacterial contamination of the work environment. Data about the state of microbial contamination of different production sites indicate that the greatest microbial contamination is at livestock production farms, where, besides bacterial and fungal microflora, agents of a number of zoonotic infections have been discovered.[7] A high index of bacterial dissemination in the air is noted in shops of cotton factories, at enterprises involved in processing secondary raw materials, and at biotechnological enterprises.[1,5,6] The degree of microbial contamination of the work outfits of workers in the aforementioned industries is also high.

The SEV [CEMA] standard 3952-82 "Special Protective Clothing. Classification and General Requirements" and GOST [All-Union State Standard] 12.4.103-83[2] call for work outfits that protect the skin against microorganisms.

The goal of the present investigation was to study the protective properties of commercially available and experimental fabrics used for work outfits to determine their permeability to microorganisms and to develop recommendations regarding fabric selection.

The research was conducted in accordance with GOST 12.4.136.84 "Labor Safety Standards System [SSBT]. Individual Protective Equipment. Method of Determining Permeability to Microorganisms."[3]

As test cultures in our determination of permeability we used cultures of Staphylococcus aureus, which is the most resistant type of the group coccal bacteria. These cultures served as indicators of aerogenic contamination and the presence of agents of pyogenic infections. We used cultures of Escherichia coli (the most resistant type of enterobacteria) as indicators of fecal contamination of the environment.

Over 16,000 tests were conducted on 26 commercially available fabrics with various hygiene characteristics, including 14 cotton fabrics, 9 commercially available mixed fabrics (65-85 percent cotton fiber and 15-35 percent capron or polyester), and 3 synthetic fabrics.

It was noted that the permeability of the fabrics to microorganisms will fluctuate over a broad interval. Cotton fabrics offered the highest protection against microorganisms, while synthetic fabrics had the highest permeability.

Of the cotton fabrics, bleached coarse calico (article No. 276) and single-color satin (article No. 546) had the highest permeability (up to 9.9 percent with regard to E. coli), and single-color moleskin (article No. 3052) had the lowest permeability (0.3 percent).

Among the mixed-fiber fabrics, single-color spun repp (article No. 3161) has the greatest permeability. The permeability of all the synthetic fabrics studied was about 30 percent with respect to E. coli.

The correlation analysis conducted did not reveal any significant connection between a fabric's microorganism permeability and its air permeability, hygroscopicity, vapor permeability, or water absorption ($r < 5$). The microbial permeability of fabrics was found to be most dependent on the type of weave of the threads.

Fabrics with a linen weave have a high microbial permeability ($p < 0.01$) as compared with silk and twill weaves.

We studied the effect of wetting with different fluids, including water and perspiration, on the fabrics' permeability to microorganisms. It was noted that for the majority of the fabrics, permeability increased 1.5- to 2-fold after they were wet. This was especially true in the case of fabrics with a linen weave in their structure. The relation of the fibers to water also had an effect on the magnitude of the protective effect: cotton fibers, which swell under the effect of water, facilitate the entrapment of microorganisms, whereas hydrophobic synthetic fabrics let them pass freely. In most cases, a lower permeability was noted for both microorganism cultures when the fabrics were wetted with perspiration. This is obviously related to perspiration's salt composition and an acid-base reaction. It should, however, be noted that the perspiration evaporation rate plays an important role. When it is removed rapidly, the skin's reaction becomes acid on account of the concentration of fatty acids with a pH of 3.0-4.0.[4] When the evaporation of perspiration is delayed, it breaks down, with the formation of alkaline products. In this case, not only does the fabric's permeability to microorganisms increase, but conditions favorable to their development are also created.

Based on the comprehensive research conducted, it has been established that diagonals (article Nos. 3006 and 3012), single-color twill (article no. 3217), single-color moleskin (article no. 3052), and drill weave (article no. 3096) have the lowest microorganism permeability. These fabrics may be recommended for the manufacture of work outfits that protect against microorganisms.

Conclusions

1. Fabrics used to manufacture work outfits in different branches of industry, including those with high microbial contamination, have varying degrees of microbe permeability.

2. From the standpoint of microorganisms, cotton fabrics afford the greatest protection, whereas synthetic fabrics afford the least.

3. The permeability of fabrics for microorganisms largely depends on the type of weave of the threads; fabrics with a linen weave have the highest permeability.

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UDC 613.5:628.8](049.32)

Aleksandrov Reviews Novozhilova and Lomova Book on Hygiene Assessment of Microclimate

18400484b Moscow GIGIYENA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 1, Jan 89 pp 50-51

[Review by V. N. Aleksandrov of book "Hygiene Assessment of Microclimate," by G. N. Novozhilova and O. P. Lomova, Moscow, Meditsina, 1987, 110 pages]

[Text] A number of scientific works devoted to various problems in hygiene assessment of the microclimate have recently been published. On a scientific plane, however, the problem is still far from resolved and demands new research and theoretical summary. The title of the book being reviewed here fully reflects its content since hygiene assessment of the microclimate implies not only the characteristics of the external environment, but also the respective responses of the human body.

The monograph consists of five chapters, an appendix, and 20 figures.

The first chapter is devoted to general theoretical aspects of the body's adaptation to the microclimate. The authors justifiably emphasize that when various environmental factors act upon the body, the physiologic mechanisms of adaptation are universal in nature in terms of the development of adaptive responses and are geared toward increasing nonspecific resistance. Special attention is paid to how to analyze and interpret the results of the body's response to unfavorable environmental factors. It is obvious that an approach to subdividing the body's responses into adaptive and compensatory responses is possible here. One must agree with such methodological approaches to the hygiene assessment of factors.

The mechanisms of thermal adaptation are examined in comfortable and uncomfortable microclimates. Heat build-up and release in the body are properly analyzed with respect to the fundamental heat balance equation and on the basis of energy exchange characteristics.

The chapter ends with the conclusion that the degree of functional stress of such basic systems of the body as the central nervous, hypophyseal-adrenal, and sympathetic-adrenal systems are the criteria of adaptation to an unfavorable microclimate.

The second chapter discusses a hygiene approach to comprehensive assessments of the microclimate. A detailed analysis is presented of the existing indicators of the status of the microclimate and the comprehensive indicators that are most widely accepted in the literature: effective, resultant, and adjusted effective temperature; index of predicted perspiration; and some others.

The authors establish that, of the comprehensive indicators they examine for a hygiene assessment of the microclimate, the most advisable for scientific-practical purposes are the global and adjusted effective wet-bulb temperatures.

Using modern biochemical research as a basis, chapter 3 examines the status of the endocrine system and mineral exchange during people's adaptation to an unfavorable microclimate. The possible mechanisms of the thermally induced variation in total protein content and some of its fractions in the blood plasma of individuals that are tested are studied and analyzed.

Chapter 4 examines such hygienically important integrated indicators as fitness for work and morbidity. The model of the development of fatigue that the authors have developed makes it possible to forecast fitness for work and morbidity in persons exposed to an unfavorable microclimate. It is emphasized that one way of preventing reduced fitness for work is to implement specific sanitary-hygiene measures, which are the subject

of chapter 5. Chapter 5 presents original material on experimentally substantiating an efficient regimen for preliminary heat adaptation. Research is conducted on whose basis the most efficient preliminary heat adaptation regimen has been substantiated and has been recommended for practical application. In this chapter the authors also present interesting material dealing with assessing the possibilities for making practical use of certain pharmacologic preparations for purposes of preliminary heat adaptation.

Theoretical and applied recommendations for organizing the monitoring of heat adaptation and for conducting a preliminary heat adaptation and a comprehensive assessment of the microclimate of various locations are presented in Chapter 6. They are of great interest.

At the same time, it would have been desirable if, in addition to the nomograph method of assessing comprehensive indicators of the microclimate, the monograph had included a tabular method (like that of V. V. Shib, for example). The tabular method is more convenient to use in practical work, and it would have facilitated precision of calculation. The dimensions of the nomographs are not given metrologically, and their scale is very small. All of this can magnify the error of the microclimate measurements, which may turn out to be larger than the standardized value.

In conclusion, it should be noted that the work reviewed here is based on a great deal of the authors' own experimental material and literature data, is of great scientific interest, and will provide needed help to specialists in the field of labor hygiene and occupational illnesses. The monograph fills the existing gaps in the this scientific problem. When it is reprinted—and in our opinion this would be advisable—the dimensions of the nomographs should be expanded considerably in accordance with metrological requirements, so as to ensure the unity and precision of the measurements of microclimate parameters.

UDC 616-006.6:615.849.19:621.373.826

Selectivity of Laser Action on Biological Tissues

18400415d Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 3, Mar 89 (manuscript received 13 Jul 88) pp 736-739

[Article by A.V. Ivanov, G.G. Petrash, M.A. Kazaryan, K.I. Zemskov, A.Ya. Fayenov, V.V. Chvykov and V.L. Shabarov, Scientific Research Institute of Experimental Tumor Diagnosis and Therapy, All-Union Oncological Scientific Center, USSR Academy of Medical Sciences; Physical Institute imeni P.N. Lebedev, USSR Academy of Sciences, Moscow]

[Abstract] In order to enhance the specificity of laser therapy in oncologic practice an analysis was conducted of factors germane to such considerations. A feed-back system based on internal resonators was constructed to direct the laser beam at the lesion site and to be responsive to variability in the lesion due to movement and other physiological variables, via adjustment of beam intensity and targeting. Experimental studies on A Snell mice that were subcutaneously implanted embryocarcinoma and treated with a dye (a porphyrin derivative) to enhance the photodynamic effect showed enhanced therapeutic specificity both in terms of the photodynamic effect and in targeting. As a result, the time of irradiation with the copper vapor laser was reduced to 5 sec because of increased intensity of the beam targeted only at the site of the lesion. The methods and ideas outlined in this article for enhancing the specificity of laser management of neoplastic lesions are also applicable to other conditions under appropriate circumstances. Figures 3; references 9: (Russian).

UDC 577.151.043:612.014.41/45

In Vitro Evaluation of Biological Effects of Laser Irradiation

18400421a Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA: BIOLOGIYA in Russian No 3, Feb 89 (manuscript received 31 Mar 88) pp 66-70

[Article by V.B. Matyushichev, Ye.M. Vereshchagina, A.I. Soldatov and V.V. Titov]

[Abstract] An analysis was conducted on the bioeffects of light components of a copper laser diode on alkaline phosphatase, lactate dehydrogenase, and alanine aminotransferase of plasma and whole donor blood. The samples were irradiated in doses of 1, 2, 3, 6, or 9 J with either green (510 nm), yellow (578 nm), or yellow-green combination light (3, 6, 9 J), followed by analysis of enzyme activities. Assessment of the effects showed that the green component was relatively innocuous in terms of enzyme activity, while yellow and mixed light evidenced similar effects. Analysis of the variable effects demonstrated that the effects of the laser diode components are not additive, but that the net effect reflects interaction of the different wavelengths. Furthermore, green light was shown to modify the effects obtained with the yellow light in certain combinations. The results of the interaction were partially dose-dependent, but not wholly so. The results also suggested that the color of light may also have been a contributing factor to the biological effects that were observed. The dose-effect relationship was nonlinear, with the low doses (1 or 2 J) often showing disproportionately large effects, supporting the contention that indirect or secondary mechanism is very important in laser bioeffects. References 5: (Russian).

UDC 619:591.111.04

Influence of Laser Radiation on Morphofunctional Blood Status

18400469a Moscow VETERINARIYA in Russian No 1, Jan 89, pp 49-51

[Article by V. I. Izdepskiy, M. V. Rublenko, Belotserkovskiy Agricultural Institute]

[Abstract] Monochromatic coherent red polarized light is used to treat animals and stimulate productivity in them, but the mechanisms of laser biostimulation have been little studied. In one experiment, the effect of the laser radiation on formed elements and biochemical blood components was studied, plus the possibility of photostimulation of enzyme and energy systems in phagocytes and humoral nonspecific immunity factors. Laser activation of the blood was found to increase bioenergetic and biosynthetic potentials of the bactericidal and energy systems of the phagocytes, thus increasing the protective function of the white blood cells. Administration of laser-stimulated blood to animals caused significant reactions with several phases. There was a clear biostimulating effect on the resistance of the organism. Visible laser light increased the functional capabilities of the cellular and humoral nonspecific immunity factors.

UDC 616.127-005.8-037-07:519.254

Expert-Statistical Methods for Development of Algorithms for Prognosis of Myocardial Infarctions

18400423a Moscow MEDITSINSKAYA TEKHNIKA in Russian No 6, Nov-Dec 88 (manuscript received 28 Mar 88) pp 16-22

[Article by L. D. Meshalkin and A. F. Galkov]

[Abstract] With the development of information systems in medical institutions, an ever broader mass of therapeutic, instrumental and laboratory information on patients is accumulating. The material needs to be synthesized and analyzed so as to be of use in the evaluation of patients' health, in differential diagnosis, and in prognosis. The authors describe a prognosis system for myocardial infarction and present a brief review of

mathematical statistics methods used in the development of prognostic algorithms. Two mathematical problems are described and solved during development of the algorithms. The prognostic system is based on data from the first 3 days following the infarction, from 10-12 days of the recovery period, and finally from the entire hospitalization stage for the first postinfarct year. Statistical methodology and expert-system-based development of prognostic algorithm are described. References 26: 14 Russian, 12 Western.

Shortage of Modern Equipment at Burn Center Criticized

18400576f Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Jun 89 p 4

[Article by A. Terekhin, correspondent]

[Excerpt] Interrupting their work at the congress, a group of people's deputies flew to Chelyabinsk. They visited the metallurgical combine's burn center and found out what treatment resources are needed. In a television interview, they noted the center's extremely low supply of modern equipment.

Professor N. Atyasov is hoping for help from the Supreme Soviet deputy in organizing the production of Soviet-made dermatomes designed by M. Kolokoltsev. This deserves to be discussed in some more detail.

N. Atyasov is from Saransk, but he worked for many years with M. Kolokoltsev at the All-Russian Burn Center at the Gorkiy Scientific Research Institute of Traumatology and Orthopedics. He is treating burn patients by a new method, in which the skin cover is restored more quickly.

"In my opinion, Kolokoltsev has developed the world's best apparatus, with self-sharpening blades and precise regulation of the thickness of the skin," said N. Atyasov. "With it, one can take skin grafts from any part of the body for transplanting. Tens of thousands of such apparatuses a year should be produced."

Many years ago, a Gorkiy plant made 36 such apparatuses in response to a personal request from Kolokoltsev. That's all.

"No matter where we have turned since then, things have remained at a standstill," continued N. Atyasov.

FTD/SNAP

Soviet Progress in Heart Transplantation Discussed

18402028b Moscow MEDITSINSKAYA GAZETA in Russian 2 Apr 89 p 3

[Interview with V. I. Shumakov, director of USSR Ministry of Health Institute of Transplantation and Artificial Organs and academician of USSR Academy of Medical Sciences: "Heart Transplantation: Is the Gap Being Closed?"; first paragraph is MEDITSINSKAYA GAZETA introduction; correspondent's questions are in italic]

[Text] **Two years ago our newspaper and PRAVDA simultaneously reported the first successful heart transplant in our country. We followed the fate of Aleksandra Shalkova, reporting about her often in the beginning, and then less often as the fear for her life subsided. We also followed the development of the entire field of clinical heart transplantation, which our country began 20 years after the rest of the world. Twenty years and two years—is the gap being closed between us and the achievements of our foreign colleagues? We talked about this with USSR Academy of Medical Sciences Academician V. I. Shumakov, director of the Institute of Transplantation and Artificial Organs.**

We met Monday morning, but Valeriy Ivanovich looked tired.

"I was in surgery until 2 A.M....We performed a transplant on a 44-year-old patient."

"But why on Sunday?"

"You know, of course, that we depend on the donor. The donor organ must match the recipient with respect to an entire series of precisely established parameters. It is important that they coincide not only from the standpoint of blood group and immunologic indicators, but also from the standpoint of anthropometric data, plus the absence of a rather wide group of diseases in the anamnesis of the person pronounced brain-dead. Complications with donor organs are experienced throughout the world. And in our country the problem is exacerbated by the poor conditions in many resuscitation departments, which don't always have the equipment needed to make the diagnosis of 'brain death.' And, perhaps, in the past two years there have not been any noticeable changes here. So, if a suitable donor appears, we use tes opportunity to help patients who need a heart transplant, whether it's Sunday or any other day of the week."

"It was only in late 1986 when the necessary legal documents were approved and a number of our cardiac surgery clinics were given permission to perform heart transplants. How far along have we been able to move on this path?"

"Twenty-three heart transplants have been performed at our institute. Twenty patients are alive. Shura Shalkova has survived for more than two years, and four other patients have survived more than a year; all are feeling well. Unfortunately, other clinics that have attempted to perform such operations have not yet had comforting results."

"Why not?"

"I'm not going to try to give a complete analysis of the reasons. But in my view, there is a very important condition that is sometimes forgotten. Successful heart transplantation requires that the clinic have accumulated experience in the field of transplantation, regardless of what organ. In other words, the many facets of the immunologic aspects have to have been worked out: selection of the donor-recipient pair, immunologic monitoring, immunosuppressive therapy tactics, and so forth. And besides this, services that would seem to have nothing to do with transplantation must be properly in place. In our institute, for example, patients have needed hemodialysis and hemosorption and a number of other technics. Only with this type of integrated approach is it

possible to achieve positive results. Surgical technology, even the most advanced, still does not determine long-range success."

"According to foreign statistics, the percentage of positive results from heart transplant approaches 80 percent. Your success rate is barely more than half. How do you explain this difference, which is not in our favor?"

"By the fact that we are just starting on the path, and we are accruing our own experience. After all, no matter how much special literature you read or how much of others' work you watch, until you do it yourself, it doesn't do you much good. Anyway, our foreign colleagues feel that what we have managed to do in two years represents success. And we will increase the quantity and quality of such operations."

"Does that mean that the gap is being closed?"

"Well, we still haven't closed the gap. We are searching for our own path and have great hopes with regard to a two-stage operation. After all, a heart transplant is performed on a patient who is in the terminal stage of cardiac insufficiency, when the use of other therapeutic methods holds no promise. Such patients are seldom in any condition to wait long for a heart transplant—we just spoke of the problems with donor organs. In this case we will use as a first step the implantation of an artificial organ. It doesn't have to be a whole artificial heart—depending on the indicators, artificial ventricles may suffice. Such implants have been developed and are being manufactured at our institute.

"We have already performed one implantation of an artificial heart, with the subsequent transplantation of a donor heart. Two-stage operations are very complicated, both technically and from the standpoint of patient care. Only a little over a dozen clinics throughout the world have become involved in this problem. But the field is promising, and this year already, we will be actively involved in it, which, we hope, will move us up to the front lines in modern heart transplantation."

"Even though officially the negative attitude toward heart transplantation has been overcome, you still hear things like 'Why do we need these expensive experiments? Wouldn't it be better to spend our money on developing and expanding routine cardiac operations or, better yet, preventing cardiovascular diseases?'"

"Ask Shura Shalkova about this. Ask any other person who is alive thanks to these 'expensive experiments.' Such contrapositioning is unethical and inhumane. Yes, a heart transplant is not cheap. But is it comparable to the value of a unique human life? And if we are speaking of the prestige of science and health care, then today a heart transplant is the calling card of medicine."

The sound of the paging system interrupted our conversation: "Valeriy Ivanovich, the patient has been prepared for surgery. We are waiting for you."

Shumakov smiles in response to my questioning glance: "No, not a transplant. An ordinary heart operation."

An ordinary heart operation....Why, not so very long ago, that would have seemed blasphemous to some, and fantasy to others.

UDC 615.47.03:616-07]:658.52.011.56

Expert System for Treatment and Diagnostic Processes

18400423b Moscow MEDITSINSKAYA TEKHNIKA in Russian No 6, Nov-Dec 88 (manuscript received 20 Jun 88) pp 23-41

[Article by Z. B. Rakhmanova and S. V. Ulyanov, Republic Information-Computer Center, AzSSR Ministry of Health, Baku; Institute of Physical-Technical Problems, Moscow]

[Abstract] Existing expert computer systems aimed at assisting practicing physicians were reviewed. They are de facto consulting systems for practicing intensive care specialists, as they face a multitude of urgent questions in their work. Detailed description of therapeutic-diagnostic system LEDI-Z was given, the first generation of which was based on an ES 1033 computer and was designed to solve problems of kidney disorders and to prescribe individualized formulation of the dialysate. Specific examples were given showing the step-by-step process of reaching a clinical decision from the input produced during patient examination. This program is capable of reproducing instantaneously the changing dynamics of a pathological state at each examination and enables flexibility in changing treatment strategy. Figures 10; references 45: 25 Russian, 20 Western.

UDC 615.471:681.31].03

Microcomputer-Based Medical Terminal

18400423c Moscow MEDITSINSKAYA TEKHNIKA in Russian No 6, Nov-Dec 88 (manuscript received 29 Sep 87) pp 41-44

[Article by A. A. Rybchenko, Yu. A. Lebedev, S. A. Ryabkov, I. A. Zubkov and G. A. Shabanov, Information Retrieval and Computer Center of the Health Care Division, Primorskiy Krayispolkom, Vladivostok]

[Abstract] Wide availability of microcomputers has made it possible to set up a network of medical terminals that are located in rural hospitals and that are connected via dedicated telephone lines to the consultation and diagnostic center of a kray hospital. The authors describe a medical terminal that is based on DVK-2M microcomputer and present a structural diagram of the network with digital transmission of information via a telephone communications link. The system is capable of storing and processing medical information and transferring it to the consultation-and-diagnostic center. Protective algorithms for the information being transferred were

developed including automatic error corrections. This unit could be used not only in setting up an automated system of emergency medical care, but also for solving problems associated with other health care sectors. Figures 2; references: 7 (Russian).

UDC 616-053.2-084:658.52.011.56

Computerized System for Prophylactic Mass Health Screening of Children (ASPON-D)

18400423d Moscow MEDITSINSKAYA TEKHNIKA in Russian No 6, Nov-Dec 88 (manuscript received 7 Jun 88) pp 45-50

[Article by V. M. Akhutin, I. M. Vorontsov, A. I. Belyayevskiy, A. Ye. Iorish, M. O. Ioffe and V. V. Shapovalov, Special Design Bureau of Biological and Medical Cybernetics, Leningrad; Leningrad Electrical-Engineering Institute imeni V. I. Ulyanov (Lenin); Leningrad Pediatric Medical Institute]

[Abstract] Health screening of children is one of the most important activities of preventive medicine. Because of inadequate medical staff support, the detection rate of sick individuals is low and the participation in screening procedures is very low. Computerization and automation of such screening examinations should correct these shortcomings. To achieve this, a computerized system of prophylactic examination of children (ASPON-D) was developed for the 3-15-year-old age group to detect various abnormalities and disease risk based on 22 profiles of pediatric pathology, coupled with referral to various specialists for further workup. Four subsystems were utilized in this approach: parents' questionnaire, physical examination, instrumental examination (respiratory-cardiac evaluation) and laboratory studies. The program for ASPON-D was written in a combination of Pascal and assembler languages. Two data bases are maintained: a global one (all the information obtained during a year and kept permanently on disk) and a current base (daily reports with temporary storage during the examination and data analysis). In 1987 this system was incorporated in the Pediatric Clinic #44 in Leningrad, with immediate improvement observed by comparison with the past screening programs. Figures 1; references: 1 (Russian).

UDC 616.12-008.318-07.681.31

Automated Electrocardiographic Diagnosis of Fundamental Heart Rhythm Disturbances in a Remote Cardiologic Consultation-Diagnostic Center System

18400466 Moscow KARDIOLOGIYA in Russian Vol 29 No 1, Jan 89 (manuscript received 22 Dec 87), pp 25-29

[Article by E. Sh. Khalfen, O. K. Rybak, Leningrad Scientific Research Institute of Cardiology]

[Abstract] The creation of remote consultation-diagnostic centers with computer analysis of ECG records can greatly facilitate early diagnosis of cardiovascular diseases. The authors have created such a center based on an Elektronika-60 or Elektronika-100/25 computer and a telemetry system called "Volna" [wave]. The ECG signal is filtered to eliminate noise and transmitted to the computer center, where clustering of P-Q and R-R intervals is used to diagnosis heart rhythm disorders. Analysis of 672 ECGs indicates that the system sensitivity to fundamental heart rhythms averages 96.9%, with a specificity that averages 98%. The method is recommended for computer diagnosis of fundamental types of heart rhythm, including automated evaluation of ECGs transmitted by telephone. References 5 (Russian).

Operations of Mobile Hospital at Ufa Airport

18400576d Moscow IZVESTIYA in Russian 6 Jun 89 p 2

[Article by F. Ivanov and A. Zinovyev]

[Abstract] The article is an on-the-spot report on emergency operations which had been organized following the recent accident on the Trans-Siberian Railroad.

It is reported that a civil defense unit commanded by General-Major Gennadiy Konstantinovich Kravchenko was removing bodies from the wreckage and conducting rescue operations. Helicopters piloted by officers of the Ufa Higher Military Aviation School for Pilots were transporting injured persons from the place of the accident to hospitals in Ufa. A large burn-treatment center had been set up at the hospital of a metallurgical complex in Chelyabinsk. By 5 June, about 150 accident victims had been admitted to hospitals of this city, and teams of physicians had arrived from other cities.

A conversation is recorded with Vladimir Ilich Milevskiy, one of the organizers of a mobile hospital which had been set up at the Ufa airport on the edge of the flying field. Milevskiy, who is scientific-technical director of a program for emergency rescue work in massive accidents and natural disasters, expressed regret that this hospital could not have been set up sooner and directly at the place of the accident. Although the hospital was developed at the USSR Ministry of Health's Institute of Medical-Biological Problems for rendering assistance to crews of spaceships, it has been used more and more often in disasters, Milevskiy related. It is equipped for surgery, burn therapy and roentgenography and could have received its first patients 15 minutes after its equipment was unloaded. During the night, it had received about 200 injured persons and dispatched them to various hospitals, and it was currently preparing 60 patients for transportation to Moscow. A team of young people was helping medical personnel load accident victims into a TU-154 airplane and other aircraft at the airfield.

Yevgeniy Ivanovich Chazov, USSR minister of health, was accompanying one group of patients on a flight. He

reported that 762 persons had been hospitalized by the morning of 5 June and that 32 of them had died. The first airplane to Moscow carried 55 patients, who were to be delivered to the Children's Burn Treatment Center, the Institute imeni Sklifosovskiy, and the Institute imeni Vishnevskiy, where the Central Burn Treatment Center is located. The best medical personnel and equipment had been concentrated at local hospitals, but the hospitals of Ufa and Chelyabinsk were already overcrowded. Some of the patients whose condition was less severe were therefore being transported to Moscow. Chazov noted that such a large number of cases of serious burns had never before been encountered in the country's medical practice, and that this was complicating the work of medical personnel.

FTD/SNAP

Ophthalmology-Clinic Vessel 'Bulgakov' Outfitted in West Germany

18400576e Moscow PRAVDA in Russian 9 Jun 89 p 8

[Article by N. Gogol, correspondent]

[Abstract] The article reports on features of the motor ship "Mikhail Bulgakov," which was completed recently at a shipyard of the "Lloyd Werft" firm in Bremerhaven, West Germany. The "Mikhail Bulgakov" is said to be the world's first vessel intended for provision of clinical ophthalmological services.

It is recalled that this vessel was equipped for the USSR in line with an idea of Svyatoslav Nikolayevich Fedorov, general director of the interbranch scientific-technical complex (MNTK) "Eye Microsurgery." In January of this year, the MNTK and the joint-stock commercial enterprise "Sovkomflot" signed a contract with the West German firm for outfitting a clinical vessel. A sea ferry which had been in service for some time was rebuilt for this purpose, and the "Mikhail Bulgakov" was delivered to the Soviet clients early in June.

The clinical vessel is said to have a displacement of 10,000 tons, and it can carry 470 passengers. A new liner-type prow was attached to the blunt prow of the former ferry. The "Mikhail Bulgakov" has 127 comfortable cabins and a microsurgery complex. Its facilities include a computer in whose memory data on patients is stored; offices for preliminary and intensive examinations of patients; a laboratory in which the condition of patients is studied by means of analyses and tests for AIDS are conducted; and a set of surgical equipment called "Romashka." Patients are examined with the aid of computerized ophthalmological instruments and a unique endothelial microscope, which is used to determine the condition of the eye on the cellular level.

The first international cruise of the ophthalmological vessel reportedly is planned for this year. During this cruise, the "Mikhail Bulgakov" will pass through the Persian Gulf, stopping at the port of Dubai (United Arab Emirates), and proceeding on to Italy, France, Brazil, India and Australia.

FTD/SNAP

UDC 579.842.23:579.253].04:615.281.08

Trimethoprim Sensitivity of Yersinia Pestis Isolated From Various Natural Plague Foci

18400422a Moscow ANTIBIOTIKI I KHIMIOTERAPIYA in Russian No 1, Jan 89 (manuscript received 1 Apr 86) pp 42-46

[Article by A. N. Kravchenko and B. N. Mishankin, Rostov-on-Don Scientific Research Antiplague Institute]

[Abstract] An evaluation was conducted on the sensitivity of wild strains of Yersinia pestis isolated from 12 endemic areas to trimethoprim, since in many cases the use of the antibiotic as the sole therapeutic agent has been ineffective in various bacterial diseases. A total of 134 wild isolates were assessed when grown on agar medium supplement with increasing concentrations of trimethoprim (0.2 to 2000 μg/ml), with the results enumerated after 48 and 72 h at 28°C. In all cases the minimum inhibitory concentration was shown to be in the 0.4 to 2 μg/ml range, indicating sensitivity. Addition of thymine or thymidine to the medium did not affect the majority of the isolates, except those isolated in the Transcaucasus and Mongolia. In the latter two cases the inhibitory concentration rose to 2000 μg/ml trimethoprim. The isolates from Transcaucasia and Mongolia were determined to be arginine-dependent, but the relationship between arginine-dependence and trimethoprim resistance in the presence of thymine or thymidine remains to be clarified. References 15: 11 Russian, 4 Western.

UDC 615.33:[579.834.94:579.253].012.6

Inhibitor Production—Stable Trait of Plague Pathogen

18400422b Moscow ANTIBIOTIKI I KHIMIOTERAPIYA in Russian No 1, Jan 89 (manuscript received 8 Aug 86) pp 46-48

[Article by L. I. Gramotina, Scientific Research Antiplague Institute of the Caucasus and the Transcaucasus, Stavropol]

[Abstract] Growth inhibition studies conducted on casein hydrolysate medium supplemented with 0.6 percent lithium chloride led to the detection of a pesticin (growth inhibitor) produced by plague bacilli isolated in endemic areas (northwestern Caspian region, subalpine Daghestan, Arakinsk, and Transcaucasus). These observations supplemented reports in the literature that the plague bacillus is capable of producing a pesticin active against the producing strain and against other isolates of

the plague bacillus obtained from the same endemic area. References 8 (Russian).

UDC 579.841.11.04:615.281:547.551.525.211.1].08

In vitro Susceptibility of Pseudomonas mallei to Sulfanilamide Combinations

18400422c Moscow ANTIBIOTIKI I KHIMIOTERAPIYA in Russian No 1, Jan 89 (manuscript received 2 Apr 87) pp 48-52

[Article by N. A. Lozovaya, Volgograd Scientific Research Antiplague Institute]

[Abstract] In view of the paucity of data on the susceptibility of Pseudomonas mallei to sulfanilamides, an in vitro analysis was performed to assess this parameter in vitro with individual sulfanilamides and their combinations with trimethoprim. Tube dilution studies with nine strains of Ps. mallei showed that the minimum bactericidal concentrations ranged from 0.78 to 6.26 μg/ml for trimethoprim, 0.39 to 3.12 μg/ml for sulfisoxazole, and 0.39 to 1.56 μg/ml for sulfamonomethoxine. Combinations of the sulfanilamides with trimethoprim were much more bactericidal, with the synergistic effects evident in concentrations of 0.012-1.56 μg/ml for the sulfamethoxazole:trimethoprim (5:1) combination, 0.09-1.56 μg/ml for the sulfamonomethoxine:trimethoprim (2.5:1), 0.022-0.39 μg/ml for the sulfisoxazole:methoprim (5:1) and 0.022-0.19 μg/ml for the last combination in a ratio of 2.5:1. References 21: 9 Russian, 12 Western.

Certain Peculiarities of Biochemical Mechanisms of the Phytotoxic Effect of Macrocyclic Trichothecenes From Dendrodochium Toxicum

18400510 Kiev MIKROBIOLOGICHESKIY ZHURNAL in Russian Vol 51 No 1, Jan-Feb 89 p 107

[Abstract of Report No 6963-B88 by T. I. Tugai, A. M. Zaichenko, and Ya. Pavlovka deposited at VINITI on 13 Sep 88]

[Text] Certain aspects of metabolism related to biosynthesis of pigments in Chlorella vulgaris str. 62 have been studied. This strain has shown a depigmentation phenomenon, when its cells were treated with macrocyclic trichothecenes, roridin A, in particular. It is shown that the introduction of ADP and acetyl-CoA together with roridin A into the chlorella cultivation medium does not prevent development of , while addition of ATP induces a reducing effect as to the synthesis of pigments.

UDC 579.843.94:579.253].083.13

Precipitation Reaction in Agar As a Method of Selecting Fractionless Strains of Plague Microbe

18400478 Moscow LABORATORNOYE DELO in Russian No 1, Jan 89 (manuscript received 16 Dec 87), pp 68-69

[Article by N. A. Gvozdenko, Rostov-na-Donu Scientific Research Antiplague Institute]

[Abstract] Many authors have demonstrated the existence in nature and the possibility of selection under laboratory conditions of several versions of the plague microbe which are defective in their antigen composition. The purpose of this work was to improve the agar precipitation reaction with antiserum to investigate populations of any strain of Yersinia pestis heterogenous in terms of antigen composition or seek mutants defective in fraction 1 after exposure to the corresponding agents. Two methods were used for agar precipitation: (1) addition of agglutinating serum to the agar on which the culture was grown, and (2) application of a layer of 0.7% LB or Hottinger agar containing the serum in the required concentration after appearance of a colony of sufficient size and treatment with chloroform vapor. The effectiveness of the method proposed by the authors is demonstrated, requiring the use of media different from those previously used, agar of different densities, cell-wall disintegrators such as iodine or chloroform and an indicator such as fuchsin. The method can be used to determine homogeneity of a population based on the presence of fraction 1 and to seek mutants defective in other antigens by adding the corresponding serum to the upper layer of the agar, and also in identification of mixed plague cultures within contacting microorganisms in ecological studies. References 6: 3 Russian, 3 Western.

UDC 612.816:612.89.014.426

Study of Effect of Powerful Pulsed Magnetic Field on Nerve and Muscle Preparations by Laser Diffractometry and Electrophysiology

18400411 Minsk VESTSI AKADEMII NAVUK BSSR. SERYYA BIYALAHICHNYKH NAVUK in Russian No 6 Nov-Dec 88 (manuscript received 8 Jul 87) pp 102-104

[Article by A. S. Rubanov, L. V. Tanin, V. V. Dubovik, S. V. Kozlov, L. I. Rachkovskiy, G. A. Govor, Institute of Physics, Belorussian Academy of Sciences; Institute of Solid State Physics and Semiconductors, Belorussian Academy of Sciences; Institute of Neurology, Neurosurgery and Physical Therapy, Belorussian Ministry of Health]

[Abstract] The methods of laser diffractometry and electrophysiology were used to study the influence of a powerful pulsed magnetic field on the nervous and muscle systems. Studies were performed on the fiber of a femur bicep muscle of a frog exposed to a 25 keV field pulsed 0.5 ms, with a distance between the fiber and the magnet of 0.5 to 80 cm. Specimens of the sciatic nerve of Rana temporaria placed in a Ringer solution for 1-2 hours, and the preparation then underwent electrophysical study in a 25 keV field, pulse duration 0.5 ms, tracking frequency 1 Hz, pulse total 50. The magnetic field pulse was found to cause a reliable increase in the amplitude of the action potential evoked by electrical stimulation in the nerve fiber during the first two magnetic pulses, the third pulse had no reliable influence on action potential, while subsequent pulses caused a reliable decrease in the amplitude, reaching the original value after 2 minutes. No reliable change in contraction of the muscle fiber was observed. References 4 (Russian).

UDC 615.849.112.015.4:612.438.017.1

Some Aspects of the Immunologic Mechanism of Modulation of IgE Antibody Formation Following Microwave Irradiation of the Thymus

18402148B Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 3 May-Jun 89 (manuscript received 3 Nov 88) pp 15-18

[Article by V. M. Yevstropov and G. V. Kovaleva, Kirghiz Scientific Research Institute of Restorative Treatment and Resort Rehabilitation, Frunze]

[Abstract] The immunomodulating possibilities of microwave exposure of the thymus are studied using guinea pigs exposed to decimeter waves for ten minutes. Bone marrow was also exposed to evaluate the specificity of effects observed on the thymus. The guinea pigs were sensitized using a subcutaneous injection of a staphylococcus extract. Data analysis showed that decimeter-wave exposure of the thymus during the inductive period of sensitization reduces production of IgE antibodies for staphylococcus and suppresses formation of IgE-dependent-type allergies caused by induction of the function of antigen-specific T-suppressors for IgE antigen formation. Phase dependence of the immunomodulating effect may be tied to activation of T-suppressors. Decimeter-wave exposure of the thymus, in contrast to exposure of bone marrow, induced an increase of T-cells in the spleen and of B-lymphocytes in the lymph nodes and blood. Induction of the suppressor function of T-cells may play an important role in the process of IgE immunomodulation. References 16: 4 Russian, 12 Western.

UDC 615.849.11.015.4:612.741

Mechanism of Skeletal Muscle Contractions Induced by High-Intensity Magnetic-Field Pulses

18402148D Moscow VOPROSY KURORTOLOGII, FIZIOTERAPII I LECHEBNOY FIZICHESKOY KULTURY in Russian No 3 May-Jun 89 (manuscript received 14 Dec 88) pp 53-57

[Article by Ye. M. Kalinovskiy and P. F. Vasilenko, All-Union Scientific Center for Medical Rehabilitation and Physical Therapy, Moscow]

[Abstract] The development of new types of magnetic-field generators is making it possible to create pulses of high-intensity magnetic fields that are capable of inducing muscle contraction from a distance. The researchers here performed a study of the mechanism of muscle contraction stimulated by magnetic-field pulses, a study that entailed identifying the component of the neuromuscular apparatus that is most sensitive to the field pulses and clarifying the physical aspects of the mechanism of stimulation. In one set of experiments, 18 adult female cats anesthetized with nembutal and exposed to the a 1 T pulsating field were given i.v. injections of d-tubocurarine and placed on a Vita-1 artificial respirator. Another set of experiments studied the effects of the field on muscle contraction when the peripheral nerve conductivity was blocked. A third set of experiments examined the effect of the conducting properties of the medium surrounding the peripheral nerve on the development of muscle contraction under exposure to a pulsating magnetic field. Temporary reduction of muscle contraction intensity was noted following intravenous injection of d-tubocurarine. Pulses of a high-intensity magnetic-field located 0.5-1.5 cm from the surface of the thigh were found to cause skeletal muscle contraction, which resulted from the stimulation of the motor fiber. Use of a pulsating magnetic field is promising for contactless neuromuscular stimulation when the use of traditional contact electrical stimulation is difficult or undesirable. Figures 4, references 4 (Western).

UDC 612.816:612.89.014.426

Study of Effect of Powerful Pulsed Magnetic Field on Nerve and Muscle Preparations by Laser Diffractometry and Electrophysiology

18400411 Minsk VESTSI AKADEMII NAVUK BSSR. SERYYA BIYALAHICHNYKH NAVUK in Russian No 6 Nov-Dec 88 (manuscript received 8 Jul 87) pp 102-104

[Article by A. S. Rubanov, L. V. Tanin, V. V. Dubovik, S. V. Kozlov, L. I. Rachkovskiy, G. A. Govor, Institute of Physics, Belorussian Academy of Sciences; Institute of Solid State Physics and Semiconductors, Belorussian Academy of Sciences; Institute of Neurology, Neurosurgery and Physical Therapy, Belorussian Ministry of Health]

[Abstract] The methods of laser diffractometry and electrophysiology were used to study the influence of a powerful pulsed magnetic field on the nervous and muscle systems. Studies were performed on the fiber of a femur bicep muscle of a frog exposed to a 25 keV field pulsed 0.5 ms, with a distance between the fiber and the magnet of 0.5 to 80 cm. Specimens of the sciatic nerve of Rana temporaria placed in a Ringer solution for 1-2 hours, and the preparation then underwent electrophysical study in a 25 keV field, pulse duration 0.5 ms, tracking frequency 1 Hz, pulse total 50. The magnetic field pulse was found to cause a reliable increase in the amplitude of the action potential evoked by electrical stimulation in the nerve fiber during the first two magnetic pulses, the third pulse had no reliable influence on action potential, while subsequent pulses caused a reliable decrease in the amplitude, reaching the original value after 2 minutes. No reliable change in contraction of the muscle fiber was observed. References 4 (Russian).

Emoxypin for Treating Blindness

18402026c Moscow MEDITSINSKAYA GAZETA in Russian 30 Apr 89 p 4

[Article by B. Lyukyanova, Academy of Pedagogical Sciences, Moscow, under the rubric "Here and There: Briefs on Various Topics": "Emoxypin Cures Blindness"]

[Text] The USSR is beginning series production of the preparation emoxypin for treating diseases of the eye; it has no analogues. Emoxypin has been patented in the United States, France, and Switzerland. Negotiations are being conducted on the sale of licenses.

The number of blind people on the planet, according to the minimal estimates made by WHO, is approximately 50 million. Is there any hope that the use of this preparation will help prevent blindness?

"It is intended for treatment of a wide range of diseases of the eye," says the inventor of the preparation, Doctor of Biological Sciences A. Shvedova, "including those leading to complete loss of vision." Dr. Shvedova is a staff member of the Institute of Chemical Physics of the USSR Academy of Sciences.

We know that the principal source of the energy needed by any of the body's cells is the oxidation reactions that take place in the cell, primarily lipid peroxidation. Special inhibitory substances—antioxidants—regulate the peroxidation rate rigorously. Stress, elevated oxygen content, and intense light can disturb the normal course of the reaction.

Light can become a danger to vision. Mountain climbers and residents of the Far North sometimes have bad eyes from the sun's rays reflected off the white snow. Emoxypin has restored their vision. When the preparation underwent clinical tests at the Institute of Eye Diseases imeni Gelmgolts, ten persons were admitted there who had lost their vision after observation of a solar eclipse. They were successfully helped.

Emoxypin can be used for preventing photodamage to the retina, for resorbing intraocular hemorrhages, and for increasing visual acuity.

UDC 616.127-005.8-085.2-092.9

Experimental Therapy of Myocardial Infarction With a Natural Electron Acceptor

18400409b Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA in Russian No 12, Dec 88 (manuscript received 13 Jun 88) pp 56-60

[Article by G. S. Levin, A. G. Kurmukov, Ts. L. Kamenetskaya, O. A. Yermishina, V. B. Shneyvays and Ya. Ya. Dregeris, All-Union Scientific Research Institute of Hematology and Blood Transfusion and the Scientific Research Institute of Cardiology, Uzbek SSR Ministry of Health]

[Abstract] Experimental trials were conducted with the application of the electron acceptor 1,4-naphthoquinone (AK-135) in the treatment of myocardial infarction in albino rats. The infarct was induced by ligation of the left coronary artery. Within 5 min the experimental animals were treated with either 7 mg/kg 1,4-naphthoquinone i.p. or 2 mg/kg i.v. Monitoring of the animals 7 days after the infarct showed that the necrotic area was reduced by 47 percent in animals treated with 1,4-naphthoquinone in comparison with the untreated animals. In addition, EKG studies demonstrated that 1,4-naphthoquinone also mitigated the extent of damage evident on EKG recordings. Finally, 1,4-naphthoquinone was also shown to enhance the antiradical activity of serum lipids in rats with myocardial infarction to a statistically significant extent in comparison with the untreated animals. The efficacy of 1,4-naphthoquinone in the animal model of myocardial infarction was attributed to inhibition of lipid peroxidation and acceptance of electrons from NAD.H in a situation where the redox chain reaction in myocytes is disturbed. References 7 (Russian).

UDC 616.936.092.9-085.283.926

Determining the Optimum Techniques for Treating Experimental Malaria With Artemisinin

18400410a Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6, Nov-Dec 88 (manuscript received 16 Mar 88) pp 8-13

[Article by O. V. Fedorova and Ye. I. Khomchenovskiy (dec.), Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow]

[Abstract] Therapeutic trials were conducted with artemisinin to determine the optimum dosages and routes of administration in the management of Plasmodium berghei-infected outbred 16-21 g mice. Analysis of the survival figures demonstrated that artemisinin was effective in a dose-related manner even at low doses. Optimum results were obtained with the administration of artemisinin intramuscularly, 3.12 mg/kg/day for 5 days, for a total dose of 15.6 mg/kg. With the latter schedule a 100 percent survival rate was achieved without subsequent recurrences. In addition, a cure rate of 66.7 percent was obtained with 100 mg/kg/day artemisinin for 5 days in animals in which 70 percent of the erythrocytes were parasitized. In all tests artemisinin was found to exceed chloroquine, dabequine, and mefloquine in therapeutic efficacy in the treatment of P. berghei malaria in outbred mice. Figures 2; references 13: 3 Russian, 10 Western.

UDC 615.332.015.4.038

Experimental Determination of Antibacterial Spectrum and Therapeutic Efficacy of Novel Glycopeptide Antibiotic Eremomycin

18400422d Moscow ANTIBIOTIKI I KHIMIOTERAPIYA in Russian No 1, Jan 89 (manuscript received 14 Oct 86) pp 52-56

[Article by I. V. Malkova, All-Union Scientific Research Institute for Discovery of New Antibiotics, USSR Academy of Medical Sciences, Moscow]

[Abstract] Experimental studies were performed to assess the antibacterial spectrum of eremomycin, a novel glycopeptide antibiotic structurally similar to vancomycin, and therapeutic efficacy in 18-20 gm mice with staphylococcal or streptococcal septicemia. Testing of 240 bacterial strains demonstrated that staphylococcus and streptococcus were the most susceptible genera. Golden staphylococcus was inhibited by concentrations of 0.1 to 1.6 μg/ml, and streptococcus by 0.006 to 6.4 μg/ml. For both the staphylococci and the streptococci the concentrations of eremomycin required for inhibition of bacterial growth were 2-10 times lower than the required concentrations of vancomycin. Eremomycin was essentially equally effective on subcutaneous or intravenous administration in mice with staphylococcal or streptococcal septicemia, but generally required doses three-fold lower than those of vancomycin for the ED_{50} endpoint. In terms of the chemotherapeutic index eremomycin exceeded vancomycin and ristomycin by ten-fold or better. Figures 3; references 2: 1 Russian, 1 Western.

UDC 616.13-004.6-085.547-029.9:615.225

Isopropoxygermatrane—Inhibitor of Experimental Development of Aortic Atherosclerosis and Anticoagulant

18400426a Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 305 No 2, Mar 89 (manuscript received 27 Sep 88) pp 487-490

[Article by M. M. Rasulov, I. G. Kuznetsov, Ye. A. Yevstafyeva, E. G. Rozantsev and USSR Academy of Sciences Corresponding Member M. G. Voronkov, Irkutsk Institute of Organic Chemistry, Siberian Department of USSR Academy of Sciences]

[Abstract] The effect of isopropoxygermatrane (IPG) on the development of experimental atherosclerosis and coagulation hemostasis was investigated in rabbits. Atherosclerosis was modeled by feeding the animals 250 mg/kg cholesterol daily. After a month, the researchers checked the animals' cholesterol levels, total lipids, triglycerides, and β-lipoproteins and formed the experimental and control groups. All the animals continued on the cholesterol diet. The experimental groups were administered various doses of IPG for 3 months; control were given placebo instead of IPG. The animals were sacrificed and the levels of cholesterol, total lipids, triglycerides and β-lipoproteins were again determined. It was shown that parenteral administration of IPG at 200 mg/kg for 2 months or 40 mg/kg for 3 months exhibited antiatherosclerotic and lipolytic activity. IPG did not show a direct anticoagulation action. However, prolonged administration of IPG could stimulate endogenic production of heparin, which could be responsible for some lipolytic and anticoagulative effect observed during the long-term use of IPG. References 10: 6 Russian, 4 Western.

UDC 547.245:678.048

Influence of Isopropoxygermatrane on Lipid Peroxidation in Experimental Gastric Ulcer in Rats

18400474 Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 20, Issue 3, Dec 88 (manuscript received 10 Nov 86), pp 105-110

[Article by I. G. Kuznetsov, M. M. Rasulov, V. M. Gukasov, S. K. Suslova, Ye. Ya. Kaplan, M. G. Voronkov, Irkutsk Institute of Organic Chemistry, Siberian Division, USSR Academy of Sciences]

[Abstract] Germatranes, a new class of organic compounds of germanium, and particularly isopropoxygermatrane, significantly influence the functional activity of the thrombocytes and have a healing effect on wounds. This article studies the processes responsible for this effect in experiments performed on white rats in which chronic acetate gastric ulcers were reproduced. The experiments showed that the use of isopropoxygermatrane significantly accelerates the healing of experimental ulcers. On the tenth day of administration, for example, the animals that received the preparation showed no signs of the ulcerous defect; control animals, however, showed ulcerations on the gastric mucosa. The dynamics of the destructive processes accompanying changes in lipid peroxidation both in blood plasma and in stomach tissue homogenates in various groups of experimental animals yield a satisfactory explanation and evaluation of the biological role of germatranes and the possibility of their application in pathologic states. Isopropoxygermatrane prevents the formation of certain lipid-destruction products which of themselves inhibit repair processes; this preventive effect activates repair processes in the focus of an ulcer. Figures 3; References 11: 9 Russian, 2 Western.

UDC 612.821

Artificial Stable Functional Connections: New Possibilities in the Control of Psychophysiological Status

18400407a Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 14 No 6, Nov-Dec 88 (manuscript received 15 Dec 87) pp 883-891

[Article by A. V. Mirolyubov, I. L. Solomin and A. Yu. Shikin, Military Medical Academy imeni S. M. Kirov, Leningrad]

[Abstract] A series of trials were conducted with 72 men, 19 to 41 years of age, to assess the feasibility of controlling the psychophysiological status of an individual through type 2 artificial, stable functional connections (ASFC), as first described by V. M. Smirnov and Yu. S. Borodkin in 1979. In one trial on subjects with induced type 2 ASFC between visual photostimulation (two 30-sec, 30-Hz exposures at 0.36 W) and etimizol priming of the CNS, the individuals demonstrated improved psychophysiological balance consisting of greater self-satisfaction, confidence, and diminished susceptibility to environmental situations. Other trials utilizing the drugs sidnokarb (a stimulant) or Seduxen (a tranquilizer)—also with two 30-sec, 0.36-W, 30-Hz exposures of light—yielded two key findings. First, ASFC prolonged the typical psychotropic effect of each agent; and, second, ASFC with Seduxen differs markedly from ASFC achieved with sidnokarb. In the case of sidnokarb ASFC affects 'depressive' and 'manic' factors within the cyclothymic orbit; while in the case of Seduxen ASFC affects catatonia and paranoia, factors within the schizomimetic complex. These observations point to the utility of the ASFC approach as a method that may be used in controlling the psychophysiological status of an individual for at least a month. References 11: 9 Russian, 2 Western.

UDC 612.613:624

Comprehensive Assessment of the Functional Status of the Body

18400407b Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 14 No 6, Nov-Dec 88 (manuscript received 6 Feb 87) pp 957-963

[Article by M. Yu. Gedymin, D. K. Sokolov, I. S. Kandror, M. N. Yevlampiyeva, V. A. Osipyan and O. M. Pashinina, Scientific Research Institute of General and Communal Hygiene, USSR Academy of Medical Sciences, Moscow]

[Abstract] A group of 100 tunnel workers on the Amur-Baikal Railway (BAM) were subjected to detailed studies in order to assess their physiological status in a comprehensive manner employing a number of physiological indicators. Seventy of the workers were employed in subterranean jobs and had an incidence of colds higher than that of the 30 workers engaged in aboveground tasks. The study consisted of an analysis of paired and multiple correlations between indicators of nonspecific immunity, mental adaptability, erythemic response to UV, mean dynamic arterial BP, autonomic reactivity, and a cardiac index. The degree of correlation among the different indicators was evaluated for both groups for individuals with a work history of less than 3 years and for individuals with a work history of 3 years or more. The evaluation was based on the assumption that enhanced interaction of a given physiological system with other systems would, on one hand, enhance and expand the physiological potential of the human body and, on the other hand, deplete the potential of systems that had already expended a part of their functional reserve. The subterranean group showed strong correlation among the various indicators (r less than or equal to 0.70), indicating that the physiological mechanisms responsible for adaptation were overtaxed after 3 years of employment, in comparison with control values of r less than or equal to 0.49. These observations were felt to provide a comprehensive and objective assessment of a premorbid state in subjects regarded as being well adapted to their occupation. Figures 1; references 13 (Russian).

UDC 612.766.1+614.2

Biorhythmologic Characteristics of Adaptive Changes in the Circulatory System in Antarctica

18400407c Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 14 No 6, Nov-Dec 88 (manuscript received 26 Jun 87) pp 990-1000

[Article by V. P. Klopov, V. A. Yakovlev, L. L. Bobrov and A. M. Marchenko, Arctic and Antarctic Scientific Research Institute, Leningrad]

[Abstract] Extensive hemodynamic evaluation was conducted on 40 males, 24-50 years old, on assignment to Soviet Antarctic expeditions. Analysis of seasonal and circadian rhythms vis-a-vis the adaptive changes in the circulatory system during wintering failed to reveal any profound seasonal effects. However, circadian patterns revealed unambiguous adaptive changes in the form of hypertension, particularly late at night. The development of pulmonary hypertension may be one of the factors responsible for Polar dyspnea. These observations were interpreted to indicate that at least in some individuals the onset of adaptive hypertension may represent a premorbid state that could advance to frank cardiovascular pathology. Figures 3; references 24 (Russian).

UDC 615.475

Noncontact Coordination Meter

18400407d Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 14 No 6, Nov-Dec 88 (manuscript received 8 May 87) pp 1035-1037

[Article by D. A. Timoshenko and Ye. V. Morozova, Ivanovo Medical Institute imeni A. S. Bubnov]

[Abstract] An improved coordination meter has been devised which eliminates the conventional ring and test rod approach. Basically, the testee trains a hand-held pencil-like light sensor on a 2.5 mm diameter light spot,

and the accuracy is determined electronically under defined test conditions. Comparison of the conventional testing method with the noncontact method in the case of workers at a textile plant demonstrated that the latter was a much more sensitive modality in measuring coordination. Figures 3; references 4 (Russian).

Probability-Statistics Criteria in Evaluation of Behavioral Specialization of Neurons

18400419b Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 10 No 2, Mar-Apr 89 pp 90-98

[Article by L.V. Bobrovnikov, Institute of Normal Physiology imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow]

[Abstract] A statistical analysis was performed on the discharge patterns of 134 somatosensory cortical neurons in rabbits with food and pain-avoidance conditioned responses. Statistically significant changes in the discharge patterns were observed in the case of 48 neurons ($P < 0.001$), with 12 neurons showing a consistent pattern of diminished discharge frequency and the remaining 36 neurons evidencing an increase in the rate of generation of action potentials. Despite the identity of the motor parameters entailed in both responses, the neural correlates underlying these acts were quite different. Activation of the 12 neurons occurred only at certain stage in the progression of either the food-seeking or pain-avoidance response, with activation of three neurons taking place only under avoidance conditions and activation of nine neurons related only to food-seeking. Furthermore, the pattern of discharge in the case of eight neurons changed when the conditioned food response was replaced by pain-avoidance behavior. These observations demonstrated that a goal-oriented act is accompanied by synchronized increase or decrease in the discharge rate of certain neurons temporally related to certain stages of the motor process. The synchronization is retained even when the motor activity is varied, but may be modified when the motivation underlying motor activity is altered. Figures 1; references 43: 38 Russian, 5 Western.

UDC 612.822.3+612.821.6

Quantitative Evaluation of Degree of Freedom of Cortical Neurons During Instrumental Behavior of Animals

18400426b Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 307 No 2, Mar 89 (manuscript received 20 Jul 88) pp 494-499

[Article by Yu. Ye. Vagin, V. F. Volkov, A. A. Ryabchikov and Yu. A. Fadeyev, Institute of Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow]

[Abstract] An attempt was made to establish a quantitative measure for the degree of neuron freedom. A mathematical approach was used to establish a relationship among the sequences of neuron interpulse intervals; the duration of each interval depended on the duration of the preceding interval and on the current synaptic flow to the neuron. Experimentally, impulse activity of 10 neurons of the cat visual cortex was analyzed in 62 cycles of instrumental behavior: pressing a pedal which produced 1.5 ml milk in the feeder, approach to the feeder, milk consumption and return to the pedal for a repeat cycle of the activity. The degree of neuron freedom was determined by the randomness of T_{i+1} as a function of T_i (duration of the following and preceding intervals). It was shown that at the stage of the approach to the pedal there were many cases (30 out of 62) when the neurons did not participate in decisionmaking; during approach to the feeder neuron participation in decisionmaking increased and as a rule the neurons participated actively in decisionmaking during the consumption of milk. More work is still necessary to refine this coefficient of randomness. Figures 3; references: 9 (Russian).

UDC 616.124:577.112.856].014.43.06:613.863]
.06:612.822.1.018:577.175.822

Effects of Cerebral Cholinergic Mechanisms on Lipoprotein Metabolism in Heat-Exchange Disorders and Emotional Stress

18400461 Moscow VESTNIK AKADEMII NAUK MEDITSINSKIKH NAUK in Russian No 1, Jan 89 (manuscript received 1 Jun 88), pp 21-28

[Article by V. N. Gurin, I. N. Semenenya, and N. A. Basharkevich, Institute of Physiology, Belorussian Academy of Sciences, Minsk; Minsk Medical Institute]

[Abstract] An analysis is presented of available data on changes in the lipoprotein composition of blood plasma and the central cholinergic mechanisms involved in their regulation in hypothermia, hyperthermia and emotional stress. The data were obtained in the authors' laboratory in experiments on white rats subjected briefly to cold (by immersion in water at 25°C), heat (by placement in a dry air chamber at 40°C), and emotional stress (by immobilization under thermally neutral conditions). All three factors caused significant changes in the composition of fatty acids and content of cholesterol in blood plasma lipoprotein. In developing hypothermia, the m- and n-cholinoreactive systems inhibit the processes leading ot changes in the lipid composition of blood plasma lipoproteins, with the m-cholinoreactive systems having the greatest effect. The results indicated that the cholinoreactive systems of the brain play a special role in central mechanisms of regulating the metabolism of processes involving complex lipids under these stress conditions. Further studies will investigate the role of the cholinoreactive systems of individual brain structures in the regulation of adaptation processes involving the lipids under stress conditions and will help to solve problems related to the use of preparations which change the functional status of these systems to increase the resistance of the body to extreme conditions. References 28: 26 Russian, 2 Western.

UDC 616.857-085.357:577.175.343

Treatment of Migraine with Vasopressin

18400467 Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA in Russian Vol 89 No 1, Jan 89 (manuscript received 16 Apr 87), pp 54-58

[Article by V. S. Lobzin, N. S. Vasilyev, Leningrad Institute for Advanced Training for Physicians imeni S. M. Kirov]

[Abstract] Some 186 patients (166 females, 20 males, aged 13 to 47) who had been suffering from migraine for 2-23 years were examined. During migraine, rheoencephalography studies showed sharp increases in arterial tonus in the carotid and vertebral-basilar pools, plus signs of venous return problems. The nanopeptide 8-AVP (8-arginine vasopressin) was found to be effective in decreasing the frequency, intensity and duration of pain paroxysms, normalizing cerebral hemodynamics, emotional and autonomic vascular reactions, decreasing elevated intracerebral pressure, and improving the working capacity and sleep of migraine patients. The therapeutic effectiveness, simplicity of use and absence of side effects and complications allow the preparation to be recommended for treatment and prevention of various forms of migraine. Figures 4; References 21: 13 Russian, 8 Western.

Ministry of Health Decree Effect on Alma-Ata Cooperative

1840040 Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 15 Apr 89 p 3

[Article by V. Golovanov, Alma-Ata, under the "We Are Studying the Problem" rubric: "The Alma-Ata Cooperative has Proved to be a Stepchild"; first paragraph is published in boldface in a box above the title.

[Text] **On the facade of the Kazakh Scientific Research Institute of Oncology and Radiology building the garnish sign "Diagnost Cooperative." attracts the attention of passers-by. It occupies a wing of the ground floor of the institute. At first glance it is an ordinary medical institution. It has a registry window, doctors' consulting rooms, and a queue of patients wait on chairs placed along the corridor.**

And at the same time the Diagnost institution is somewhat unlike other outpatient clinics; it operates on cooperative principles. The patients, after first paying 10 rubles to the cashier, pay a visit to the doctors. An if an examination or medical treatment is required, it is necessary to cough up additional money. It is agreed that the situation is somewhat extraordinary. We were used to having the state be concerned about our health, and therefore care is free. And suddenly for you—you pay out for visit, examination, or medical treatment. Is this nonsense?

We shall not make hasty conclusions. Let us examine the activity of Diagnost more closely. The cooperative was founded a year ago. About 25,000 patients from all parts of the republic have been served during this time. An especially large influx of patients has come from the rural oblasts. Twenty-five thousand is an impressive number. It gives one much to ponder. An what makes one ponder most of all, obviously, is that the level of the medical service and the skill of doctors do not satisfy the patients where they live. Otherwise, why would they waste time and money going to metropolitan doctors?

Probably the patients go to Alma-Ata because they have heard of the solid professional education of the Diagnost staff. And in reality, experienced specialists who know their profession thoroughly have been selected here. Therapeutist-cardiologist Prof. L. Kulkina, neuropathologist Prof. U. Akhmetov, surgeon Prof. S. Urashev, gastroenterologist V. Afuksinidi, and urologist V. Kogan are not occupied with authority in medical circles. If you please, the popular reputation literally at lightning speed spreads to the cities and villages to bring news about some miraculous, if one can call it that, cure. In truth, often such rumors are excessively exaggerated. What is to be done—when it is a question of health, people are ready to set their hopes on a miracle. But this is the situation, in truth, and the doctors at Diagnost are indeed competent.

Patients from Dzhezhazgan, Kzyl-Orda, Taldy-Kurgan, Semipalatinsk, East Kazakhstan and other oblasts of the republic come to see the doctors. Letters even arrive from Sakhalin and from the Magadan Oblast. People are interested in how they may get an appointment. It is possible that here some patients hold the opinion that the further away the doctor, the better he is.

We tried to find out from the patients the reason why they go to Alma-Ata to doctors from the cooperative. The responses in general were similar.

"You go to visit an outpatient clinic where you live," said a Diagnost patient, "you begin to tell the doctor about your illness, but every now and then he glances at his watch: it is obvious to everyone that he does not have time to listen to the patient attentively."

These complaints have deep significance. Indeed, in the distant past wise men said with some truth, "And the word cures." A person goes to the doctor hoping for an attentive and sensitive relationship, hoping that he will be listened to and understood, and that he will be advised about healing and keeping his health. No, No, we do not intend to cast aspersions on all doctors, the majority of whom serve their profession with dedication. But they are placed within strict limits at the state outpatient clinics. A standard of 7 to 12 minutes is allowed per patient visit. It is obvious that it is difficult in such a miserly period of time to make a serious examination and have a thorough discussion with the patient. Therefore, when you are at an outpatient clinic, you observe that doctors are constantly writing something during the visit. Would it not be interesting to find out what documentation they are formulating?

But at Diagnost the time for a visit is practically unlimited. The patient has the opportunity to tell about his ailments at length and to communicate the symptoms of the illness in detail. It is believed that this plays a far from last role in the growing popularity of the medical cooperative. Leaf through the book on complaints and suggestions—in it are written numerous appreciations to its personnel.

A Rents writes, **I want to express my enormous gratitude to the surgeon S. Urashev for establishing a precise diagnosis and for advice for treatment, and, in addition, for sensitivity and attentiveness, and for cordiality and humanity. A genuine doctor must be like this! I thank him!"**

T. Demyanenko, A. Korshun, O. Yanson, and R. Bogodist left this entry, **"We are grateful to neuropathologist L. Kim for an attentive and sensitive relationship to patients, for good therapy by means of acupuncture, due to which our health has drastically improved."**

Many pages of the book are filled with such appreciations. There is also a note in which the patient expresses dissatisfaction with a protracted examination. But this complaint is the only one.

Medical cooperatives are only just groping their way and in practice are experiencing the organizational stage.

According to KaSSR Ministry of Health, a few more than fifty of them have been established in the republic. Today many questions about their activity require an answer. What is the model of a medical cooperative? Who is obliged to provide its apparatus, medicines, and reagents?

These are far from idle questions, which are graphically apparent in the example of Diagnostik. As it has already noted above, it is functioning on a base of the Kazakh Scientific Research Institute of Oncology and Radiology. Because it leases space and apparatus necessary for examining patients, it has introduced the corresponding payment. Moreover, the doctors of the cooperative keep hours beginning at 5:00 p.m., when the apparatus of the scientific research institute is not fully being used. It is used more efficiently in this way.

It would seem that such a thrifty approach in general should be welcomed: the patients from the oblasts of Kazakhstan and from faraway remote places receive the opportunity to have a thorough examination. But here the decree of the USSR Ministry of Health No 785, "The Order of the Use of Expensive Medical Equipment" has become a barrier in the path of the doctor cooperative. And the Alma-Ata city administration has reacted exceedingly vigorously—it has prohibited the use of the apparatus.

The decree of the USSR Ministry of Health has evoked a number of critical articles in the press. In particular, the newspaper IZVESTIYA came out strongly against the Ministry of Health's removal of the cooperative from the diagnostic equipment. For different reasons, expensive medical apparatus today is used only 40-50 percent of the time. This is approximately the situation which has arisen in the medical institutions of Kazakhstan. And, indeed, cooperatives of the Diagnost type raise this indicator considerably. But their position has been substantially aggravated since the ministerial decree. Previously, they were treated like poor relations, but now they were back at square one. The question arises, does such an arrangement really promote the cause of improving the protection of the health of working people? Of course not!

Public opinion forced the USSR Ministry of Health to publish a new decree and to make some relaxations for the cooperatives. The managers of the medical institutions were permitted to use diagnostic and medical apparatus to render paid assistance to self-supporting [khozraschet] institutions and to medical cooperatives by differentiating the amounts of rent. Diagnost proposed to the board of directors of the Kazakh Scientific Research Institute of Oncology and Radiology that the rate for operation of equipment be increased from 8 to 20 percent. The compensation is rather considerable. In any case, it is completely sufficient when it is necessary to repair and even purchase new equipment. But the first decree of the ministry, however, remains in force! What is to be done? In particular, we posed this question to G. G. Urmurzina, depute minister of the KaSSR Ministry of Health.

Gulshar Gozizovna Urmurzina replied, "Let the cooperative negotiate with the Scientific Research Institute of Oncology and Radiology."

It happens that the vital activity of the cooperative wholly and completely depends on the arrangement of the managers of the Scientific Research Institute. If it wishes, it authorizes the use of the equipment; if it doesn't wish, nothing can be done.

Recently we made quite a few good decisions about the development of the cooperative movement. But frequently, they are not supported by positive help from the department. Because of the weak material base, many cooperatives, including medical, cannot develop work properly.

Zh. Isabekov, president of the Diagnost cooperative heatedly complained in a conversation.

"Because of complications which have arisen recently in diagnostic apparatus, we need to curtail the volume of patient care. Recently, even staffs were reduced—a necessary measure.

The cooperative is ready to acquire equipment by its own means. But who will select it? Perhaps it will the republic production-trade association Medtekhnika?

"And we would help, but for Medtekhnika there is no such possibility," says R. Subbotin, deputy director. "The order of the state medical institutions are filled by not more than 60 percent."

What, then, is the result? Activists of the public health cooperative movement believe that it is necessary to establish state-cooperative institutions. Joint commitments between medical institutions and cooperatives must be clearly specified in agreements. Most of all it is a matter of cooperatives having the opportunity to use the equipment available at outpatient clinics. It is to be used after the end of the work day, at the time the clinic is beginning. And finally, it is not to be free. The advantage here is mutual. But most of all, the advantage is for those who need medical treatment.

Diagnost has achieved considerable popularity. And it would be well for the KaSSR Ministry of Health and the city health department to provide help and support for it. Today the cooperative critically needs it.

People's Control Committee Reprimands Medical Industry Minister for Medicine Shortages

18400422 Moscow PRAVDA in Russian 12 Apr 89 p 3

[Report by inspectors V. Zyuganov, I. Kireyev on People's Control Committee session at which medical industry minister L. Telegin received strict reprimand over shortcomings in supplies of medicines, p 3 (2000) for UD processing: "Where Is Aspirin to Be Bought?"]

[Text] **Striving to help the sick, the scientist and encyclopedist Pliny the Elder of Ancient Rome wrote in his**

"Medicine" that, for example, angina would well be treated by a compress made from 20 millipedes ground in honey, and eating a swallow nestling, desirably a bank swallow. One would have to agree that such an exotic recipe would be somewhat shocking to today's people. It would be by far simpler for us to take aspirin or streptocide. But the question that arises is this: Where are they to be had? Medicines have long been scarce in our country.

Here is an excerpt from a letter written by retiree S. Katayev living in Zuyevka, Kirov Oblast: "Elementary drugs have disappeared from the pharmacies, even aspirin. Undevit vitamins and ascorbic acid have vanished, and it is generally impossible to get preparations like ATP and cocarboxylase. It would be meaningless to continue the list of what is unavailable in our country's therapeutic institutions and pharmacies.... What can a doctor do, for example, for my arrhythmia when all he has in his 'arsenal' is sodium chloride?! I feel that this problem must be solved immediately. We can do without meat and sausage, and we'll even survive on 1.5 kg of sugar per month—we won't die. But we can't do without medical assistance."

There have been large numbers of such letters. They evoke alarm. A feeling of profound concern for the state of affairs with drugs also dominated in the meeting hall of the USSR People's Control Committee when this problem was subjected to tumultuous and incisive discussion. An inspection carried out by the committee in the first quarter revealed a dispiriting picture. The demand for medicine, even considering deliveries from foreign countries, is only 75-80 percent "satisfied." The total volume of its production per resident is around 14 rubles per year, which is eight to ten times less than in developed capitalist countries. In this case the proportion of Soviet products within the overall availability of drugs has decreased to 57 percent.

Understandably this situation did not come about in an instant. And there are many reasons behind it. First of all the absence of an adequately responsible attitude toward the needs of public health on the part of executives of the USSR Ministry of Medical and Microbiological Industry, the principal supplier of Soviet drugs. In the heat of the rush for economic well-being of subordinated enterprises, they forgot the interests of millions of people; they are troubled little by the ordeals and sufferings, by the desperate and sometimes hopeless attempts to obtain needed medicine. This is evident from the fact that since the moment that the USSR Minmedbioprom [Ministry of Medical and Microbiological Industry] was formed—that is, in the last 3 years, the rate of growth of deliveries of drugs to public health decreased noticeably. The demand of therapeutic institutions for Soviet-produced drugs is being satisfied to a lesser and lesser extent with every year (45.4 percent in 1985, 44.2 percent in 1987, 42.6 percent in 1988). The dynamics are extremely alarming. And if the government had not been purchasing drugs abroad each year at a cost of over a billion rubles, the therapeutic process in the country would have certainly been paralyzed.

The demand is not being satisfied in any of the 18 most important groups of drugs. Matters are extremely unfavorable with production of drugs by which to treat cardiovascular, psychoneurological, diabetic and oncological diseases. X-ray contrast media for diagnosis, blood substitutes, wide-spectrum antibiotics and children's medicines are being produced in insufficient quantities. Just last year the deliveries of ampules, vials and packages of various ready-to-use drugs to the USSR Ministry of Health fell short by over 70 million units.

Executives of the USSR Minmedbioprom are taking the situation so lightly that it is astounding. And in order to make themselves look good they resort to various sorts of tricks. Thus last year the ministry reported production of medical preparations worth a total of 3.29 billion rubles, but it delivered only 2.39 billion rubles' worth to its clients. How is this so? As it turns out, it is all very simple. The existing reporting system makes it possible to include semifinished products, substances and other intermediate products in the drug production volume. One need only utilize these intermediate products competently. And use them they do! As a result the production volume of ready-to-use drugs was overstated in the reports by a sum of over 90 million rubles.

The faulty practice of introducing numerous adjustments to the state plans for production and deliveries of ready-to-use drugs evolved in the ministry and in enterprises subordinated to it in recent years. Just last year the plans were changed—naturally in the lower direction—more than 150 times. Thus the production and delivery volumes are often tailored to fit the actual figures. This makes it possible for the enterprises to report their "successes" and transfer higher material incentive funds to their own accounts.

At the same time, as the inspection showed, executives of the Minmedbioprom are doing far from everything they can to achieve more efficient use of the available production potential. In the last 3 years the acetylsalacylic acid (aspirin) production section of the Usolye-Sibirskoye Chemical and Pharmaceutical Combine has been operating at a third of its capacity. A benzylpenicillin production facility introduced last year on the basis of imported equipment at the Saransk Biokhimik Combine has been utilized to a level of only 5 (!) percent. Certain production operations in the Darnitsa, Oktyabr and Latvbiofarm associations, at the Khabarovsk Chemical and Pharmaceutical Plant and many other enterprises are carrying a low load.

The quality of the Minmedbioprom's products deserves special discussion. Without going into the details, let us say that most Soviet preparations do not meet international requirements. Over a third of them have a shelf life significantly lower than foreign analogs.

The low quality of drugs is in many ways the consequence of shortcomings in the work of sector science. In the last few years the preponderance of the medicines developed by the institutes have been ready-to-use forms

based on well-known medicines that have been in use for a long time. At the same time, hardly a single original, fundamentally new preparation corresponding to international standards has been introduced into production.

The condition of equipment and productive capacities at the overwhelming majority of the enterprises does not meet the sanitary and technical norms, and it cannot guarantee purity of the product. For example in the phthalazol production operation in the Kharkov Zdorovye Association, a high level of microbial contamination of the clothing of workers, raw materials, and even of the preparation itself, which is intended by the way for the treatment of gastrointestinal diseases, was discovered. And there are many such examples. Hence follows one of the disappointing conclusions of the inspectors: We do not have a real base for organizing production of drugs at a modern level today.

Systematic failure to meet the targets for placing production facilities into operation has been a serious hindrance to the development of medical industry. In 3 years of the five-year plan, the plan for construction and installation work was only 60 percent "completed." Perhaps in no other sector of industry is this indicator so low.

The future is even more uncertain. No plans have even been made for start-up of production this year at 15 of 30 facilities that are supposed to be placed into operation in 1988-1989. This is chiefly due to refusal of local government organs to accommodate the future enterprises in connection with worsening of the ecological situation within their territories, and due to chronic delays in drawing up the planning estimates.

But let us return to the meeting hall of the USSR KNK [People's Control Committee]. As we noted earlier, the discussion was tumultuous. It became even more heated by complacent statements made by USSR First Deputy Minister of Medical and Microbiological Industry L. Telegin. He spoke second, after the atmosphere had already been electrified—so strongly had the above facts and figures affected everyone. Because of the gravity of the situation, both the committee members and all in attendance at the meeting primarily awaited sober analysis of the causes of the situation and a clear program for handling the crisis from the person responsible for the subsector's work. But Telegin's speech was strangely dissonant. It was an attempt to embellish the realities.

Naturally this elicited first a sense of disbelief and then indignation in the audience. It was impossible to believe that on the eve of the fifth year of perestroyka, executives of Minmedbioprom were still the prisoners of pretense and uncritical assessement of work done. But facts are a stubborn thing.

To make matters worse, the story of the syringes surfaced as well. Back in December 1988 the USSR Council of Ministers obligated the USSR Minmedbioprom and the USSR Ministry of Instrument Making, Automation Equipment and Control Systems to ensure production and delivery of disposable syringes to the Ministry of Health in 1987-1991. But the government target was not met. Instead of the 70 million syringes, only 50 million were delivered to the Ministry of Health in 1988, and even 84 percent of those had been purchased for currency. But what is most perplexing is that almost 30 million of the imported syringes were sent by the Minmedbioprom to public health organs without needles. Part of the shipment is still gathering dust in the warehouses.

When asked by the committee members how this could have happened, Comrade Telegin was unable to provide a reasonable answer. Attempting to present this story in a more favorable light, he became hopelessly confused. All of this elicited the corresponding reaction. Some committee members even suggested dismissing L. Telegin from his post.

Of course, it is not only the USSR Minmedbioprom that is to blame for the extremely grave situation that has evolved in the country with supplying the population and therapeutic institutions with drugs. USSR Deputy Minister of Chemical Industry S. Golubkov and USSR Deputy Minister of Petroleum Refining and Petrochemical Industry V. Germash were subjected to severe criticism at a meeting of the USSR People's Control Committee for failing to meet the targets for organizing production and delivering raw and other materials to enterprises of medical industry; USSR Deputy Minister of Chemical and Petroleum Machine Building P. Grigoryev was criticized for not satisfying the sector's demand for highly effective, modern production equipment. Serious complaints were also directed at A. Apazov, general director of the All-Union Soyuzfarmatsiya Association under the USSR Ministry of Public Health, for his unprincipled and conspiratorial behavior in reducing production of highly scarce medicines.

The USSR KNK gave L. Telegin a strict reprimand and cautioned him that if effective measures to reach the targets for production and delivery of drugs were not implemented, he would be dismissed from his post. Other ministry executives were punished as well.

In conclusion we will try to answer the question that is now on everyone's lips: "Well, all right, but what next?" We must admit that the question is a difficult one. No one, we feel, can provide an exhaustive answer to it today. One thing is clear: Too much time has been lost, too many mistakes have been made. A turning point must be achieved in the next year or two. This is why the USSR KNK ordered the divisions of the union committee and republic, kray and oblast committees to establish permanent supervision over the work of medical industry enterprises, pharmacies and other organizations.

The health of every person must become the concern of all, not just in words but in deeds as well.

Closing of Cooperative Enterprises Protested

18400433 Moscow OGONEK in Russian
No 8, 4-11 Mar 89 pp 15 and 25

[Article by Mayra Salykova: "The Cooperatives are Closing"; first paragraph is OGONEK introduction]

[Text] **Many readers have sent letters expressing the need for the next session of the USSR Supreme Soviet to bring up the question of the legality of the USSR Council of Ministers decree of December 29, 1988**

One can ascertain the number of legal contradictions contained in the decree under review, and one can count up the losses suffered by the cooperatives whose existence this decree essentially put an end to. But who can precisely say how many persons have been subsequently dissuaded from engaging in cooperative ventures, and what kind of losses have been incurred by the state and the economy as a result of that action?

Who can calculate the amount of social energy that has been lost by society when it is shown how easy it still is, without any explanation, to abrogate any kind of progressive initiative in our country during this period of perestroyka and democratization? Today in the area of cooperatives. And tomorrow?

If one realizes that not a single cooperative in our country was registered for the manufacture for any kind of weapon or manufacture and sale of narcotics, then it is easy to understand against whom this decree was directed. Because the following activities will be subsequently affected: The provision of certain types of medical services, the organization of general education schools, publishing activities, the production of cinema and video films, etc. Any person with common sense who is familiar with the document will inevitably ask the legitimate question: Why?

Once upon a time, a lanky fifth-grader was asked a similar question in our backyard by a short six-year-old, whose hockey stick the older boy had taken away. The lanky boy didn't like the question, but nevertheless laconically replied. "Because!" he said, and in order to end the conversation, he hit the little fellow in the forehead.

In that connection one would like to note that no intelligible explanations of any kind were offered either before the issuance of the decree or even a month after. No one ever got any explanations, although today we already have cooperatives which, because of this document, are essentially illegal and have closed down their operations.

At the pediatric treatment-and-diagnostic Filatovets cooperative attached to the pediatric clinical hospital imeni N. F. Filatov, I was shown the order pertaining to the hospital that was signed by Chief Physician G. Lukin. The document stated that "based on order No. 785 of the USSR Ministry of Health of October 27, 1988, and order No. 683 of the Main Health Administration of the Moscow gorispolkom of November 17, 1988... the leasing of expensive, high-performance diagnostic and therapeutic equipment and instruments to the cooperatives is forbiddent... in connection with the fact that the hospital administration and the Filatovets cooperative find it impossible to adhere to the conditions of the contract... the contract is to be considered annulled effective January 11, 1989..."

As you can see, in this case no reference to the decree was even felt to be necessary. The departmental orders completely sufficed to have the Filatovets cooperative turned out onto the street. But also turned out onto the street along with the cooperative were sick children. During the winter vacation period one could meet parents and their children from every corner of our country. After all, in contrast to the Filatov polyclinic, the cooperative served not only Muscovites, but all citizens who came to the cooperative for help.

Opponents of medical cooperatives frequently criticize them for the high cost of their services. But at the Filatovets cooperative, for example, the average cost of a consultation plus diagnosis is 16.9 rubles. Discussion about such costs would seem to be ludicrous to those parents who paid 300 to 500 rubles for a round-trip ticket to Moscow, who are forced to live weeks at a time in Moscow, using their vacation time to have their sick child examined. Of course, for some people that cost is expensive. But after all, after the cooperative was established at the Filatov hospital, the wait for an ultrasonic examination, for example, was cut to less than a third of its usual time for the usual visitors. Previously, it was necessary to wait six months, but now the wait is one and one-half months. The cooperatives simply serviced some of their patients for payment (in the evening and on days off), and the waiting time for the rest automatically decreased. The same situation applied to the wait to see medical specialists. Previously, the Filatov hospital did not have its own endocrinologist, but there was one in the cooperative. And within the framework of cooperation this endocrinologist saw patients for no fee at the rayon polyclinic. The cooperative proposed that it make available other specialists who were not available at the hospital. And now both the patients at the Filatov hospital and patients at the Filatovets cooperative are suffering equally for the lack of such specialists. In addition, the hospital is deprived of a monthly payment in the sum of 1,000 rubles obtained from the cooperative's profits, a sum which could be used to improve pediatric services.

Previously, before the appearance of medical cooperatives, the ordinary patient had to make the contact, the telephone calls, etc., in order to see a first-class specialist. True, one could still go to the reception room of the USSR Ministry of Health, where people from all over the Union have been waiting for days for permits, having brought with them to Moscow a pile of all kinds of certificates needed for official registration. By coming to a cooperative for treatment, the patient is not obligated to anyone in any way. It is possible that one may never have the need to take advantage of the cooperative-offered medical services. Nevertheless, we still should have a choice. This right of choice is also the basis of the citizens' economic freedom. And it is in fact that very right that constitutes a reliable guarantee of human dignity.

The telephone at the reception room of the Filatovets was literally exploding with calls throughout the month

of January. People were perplexed, disturbed, and asking questions. All of the callers asked the same questions: "Where am I supposed to go now? And who will help me?" Filatovets can no longer answer those questions. Those questions will have to be directed to those who have done everything they could to deprive the cooperative of the opportunity to render assistance to the needy.

Ilya Aronovich Yeluashvili, deputy chairman of the cooperative, sadly observed: "The decree of December 29 is a reaction to a competitor: '[We'll] fight the competitor not by economic methods, but physical and administrative means.'"

Pregnancies were still being interrupted in January at the LiK cooperative, about which OGONEK has already written (No 51, 1988). By evening there were already very few women in the gynecology department. Those who had come earlier for the operation had already gone home. The chief of the department showed us the premises: bright, clean, two-bed wards, each of which had its separate toilet and shower; and there was a recreation room.

I walked into one of the wards. Two women were lying on the beds covered with dazzling white sheets. One was quite young, and the other was just over 30. The first woman had had her first abortion. The second woman could compare the services offered here with those in a regular hospital.

"There simply is no comparison... I arrived here at 12 noon, which was a convenient time for me. All of the tests were done right away, and I was seen by a doctor. During the operation I felt nothing, there was no pain, because I was given an anesthetic. I came to as soon as I was back to the ward, and I was at once fully attentive. Now I shall go home. Tomorrow I'll be at work. I paid 70 rubles for the whole procedure and don't regret anything. At the polyclinic I would have been undergoing tests for a week, then I would have had to wait another week. At the hospital the ward had ten persons. It was dirty, there was only one toilet for the entire floor, and when it's time for the operation, you go feeling sorry that you were ever born... But here you don't hear a single rude word. So you say that tomorrow we won't have this kind of assistance? What then will we have?.."

Is that kind of service in the state hospitals realistic? I don't think it will be, in the near future. There is a waiting period for abortions in our country. There is a waiting period for extended hospitalization. And all of this is due to the inability of government-budgeted health care to handle the load.

Valeriy Leonidovich Glants, first deputy chairman of the cooperative, explained that they have been offering this and other kinds of services within the framework of cooperation with the city's Main Health Administration.

"Now all types of surgical services have been banned. And we shall look for ways and methods to circumvent this decree. And not only because we cannot leave surgeons and gynecologists without work. The most important thing is that there is a demand for these kinds of services. The decree cuts off a segment of medical personnel that simply cannot earn additional income. All of this will result in a drop in prestige for these important medical professions. How can one prohibit surgeons from doing complex surgery in a cooperative if they perform the same thing in their own clinic?"

At the present time LiK has a cooperative agreement with the Main Health Administration of Moscow. A one-day pediatric ears-nose-and-throat hospital is already in operation today. This hospital has been made available to Muscovites by the LiK cooperative. The service conditions are remarkable. The cooperative pays for the services of the personnel and the use of the equipment and materials. In general it pays for everything. And the Main Administration has at its disposal beds in the hospital which it distributes among the rayons of the capital. Operations are performed free of charge, at the expense of the cooperative. There is a direct relationship here—the better things go for LiK, the more medical services it renders to the city. Previously, LiK, like all other cooperatives, contributed rubles from its profits to the city. Now plans are being made to provide a part of its direct services to the city instead of money. Today that is more needed.

What are the departments afraid of in rejecting and refusing to accept such an obvious benefit for everyone? Cooperative medicine is slowly, but steadily getting on its feet. In the near future we shall have (if cooperatives are not banned altogether) parallel health care systems: A state system, which will include budgeted and cost-accounting forms, an individual system, and the cooperative. And this will certainly require effective extra-departmental supervision of health care. In essence, we already have such a body—the commissions of the local soviet ispolkoms for health affairs, the commissions of the republic-level Supreme Soviets, and the commission of the USSR Supreme Soviet. But up to now the real power lies in the hands of the departments and not the soviets. That is why the department decides which kinds of medical cooperatives you and I need and which ones we don't.

The appearance of the decree can be only attributed to the immense perplexity on the part of those who have no interest whatsoever in the expansion and healthy development of a cooperative system in the country. And there is something to be perplexed about since the development of a "civilized" cooperative system will be conducive to the extinction of many ministerial and departmental functions and will disrupt their monopoly.

Why are the cooperatives prohibited from producing cinema and video films? After all, those films undergo the same approval process as state-produced cinema and video productions. We viewers will be paying just as much for tickets to see films made by cooperatives as for any other type film. Nobody's interests are being violated. Who, then, suffers because these cooperatives exist?

The Podarok cooperative for the production and leasing of films, at the Film Studio imeni Gorkiy, has now essentially ceased to exist. Here, the young but already rather well-known director Vasiliy Pichul, producer of the film *Little Vera,* is making a new film. There were never any kind of problems at the cooperative. They were rather quickly resolved. The studio made space and equipment available, and a client was found under whose guarantee the bank provided credit totalling one-half million rubles. One-third of the film has already been made. Incidentally, the film used for making the cinema and some equipment were made available to the producer by an Italian company. A contract was to have been concluded on April 1 of this year with that company, in accordance with the Council of Ministers decree "On the Further Development of Foreign Economic Activities of State, Cooperative, and Other Public Enterprises, Associations, and Organizations." But... another decree was issued on December 29. And now how are we supposed to explain the logic of this document to foreigners if we are ourselves cannot understand it at all?

The chairman of the Podarok cooperative Mark Levin now finds himself in a difficult situation. The bank has stopped credit payments.

"At the beginning of January, I was told at the rayon bank that not only do we not have any credit available, but we must repay the bank for losses. This means that today we owe the bank 79,000 rubles! I don't have that money. The only thing we have is one-third of a film, and nothing more. And I still have other bills to pay. So far we are persuading people to work without pay. But it won't be long before everyone will start to leave."

One attorney, after having heard me tell the sad story about Podarok, with a gleam in his eye explained that it is not the cooperative that should pay the bank 79,000 rubles, but that the state should pay the cooperatives compensation equivalent to the approximate profits they would have received. "Yes, yes," he screamed," but it has to be demanded!" and with this made a chopping motion with his puny, educated hand. This attorney was right. Right in the sense that you must not dally when, in spite of all the laws, you are being done in.

Therefore it was no accident that in those very January days a long-awaited constituent assembly of the country's cooperatives was nevertheless convened and the Union of USSR Cooperatives was instituted. The young member of the Moscow Association of Cooperatives, Vladimir Sorokin, was elected chairman of the Union.

"Today there have been intensified trends in the command-bureacratic system to overregulate the cooperative system. This led to a natural protest, and the cooperative operators decided to take the initiative into their own hands. Our congress clearly demonstrated that delegates from many regions of our country unanimously supported the idea of creating a union of cooperatives. The decree of December 29 struck a blow against the cooperative system. It seems to me that the decree neither responds nor corresponds to the direction which the party has adopted for itself. We shall prepare a document which will analyze that decree in detail, and then we shall transmit the document to the USSR Supreme Soviet."

A system for the legal protection of the cooperatives is essential. It must be implemented by the law enforcement authorities without the cooperatives having to ask for protection. No kind of collective letters or demands cannot replace a system where any cooperative operator can be defended, like any other citizen, against arbitrary rule and lawlessness. Unfortunately, the cooperatives primarily affected by the decree—the medical, movie-producer, publishing, and teaching cooperatives—have not yet clearly established their roots. Many of them therefore have not yet seen the first economic returns of their labor. And those cooperatives are distinct from the public eating establishment, sewing industry, and other cooperatives which are in the public eye and simply could not cause any dissatisfaction on the part of the consumers. But then, the principal motivation behind the attempts to somehow justify the ban on cooperatives is attributed to the "numerous letters and statements from indignant citizens."

Many readers in letters to the editor that were received after New Years asked the question: Is it possible that the existence of cooperative schools would flout the principles of social justice more than tutoring? Do tutors work on a philanthropic basis? And what were the guidelines behind the "black listing" of publishing activities? Most of the cooperative publishers operate under humiliating conditions within the state publishing houses. There are no special funds to provide paper to the cooperatives. They can only use what is left over from the principal state publishing operation. What is there to ban under such conditions when proper cooperative publishing activities can't be realistically engaged in anyway?

We probably shouldn't look for a logical explanation when there simply isn't any. In rushing to defend "good" cooperatives, we don't need to leave "bad" cooperatives in the lists of the decree. After all, the cooperative system is a particular form of organization, production, and distribution. And it is for that reason that it should be treated the same way as other sectors of the country's economy. That has been inscribed in the law. That is why the appending of cooperatives to state enterprises (list No. 2 of the decree) is without any logic of any kind and is illegal, as has already been noted in articles written by jurists and economists. A cooperative in fact has the right to engage in any activity that is not prohibited to state enterprises as well.

As to the matter of what is banned by the law, why this double ban? In IZVESTIYA this decree was discussed by an official from the USSR Council of Ministers who said that people are indignant and concerned by the cooperatives' adulteration of certain medical preparations. The same discussion cited a case where in one cooperative it had been discovered that sea buckthorn oil was diluted by 50 percent with sunflower seed oil. What was to be

done with that cooperative? Good Lord, the same thing they do when they discover that the sour cream in a state store has been diluted with kefir, and milk diluted with water! Nothing special need be thought up for the cooperatives. And if one were to follow the logic of banning this cooperative, then one should immediately not only ban the sale of milk and sour cream in that state store, but also prohibit all the remaining state stores from engaging in trade ever again.

According to data from numerous recent sociology surveys of the public, there is a distinct "warming up" towards the idea of cooperatives. The basis of the negative attitude toward cooperatives and cooperative operators was and is a misunderstanding of the way in which the economic laws actually operate. An engineer earning 120 rubles is indignant that steak in a cooperative restaurant costs six rubles. But the cost of that dish results from a realistic economic accounting. One should be indignant about other things. One should be indignant about the fact that our engineer makes 120 rubles, and he's trying to understand what actual accounting results in that figure.

But so far here we have a clear shift of public negative energy to the cooperatives. According to the estimates of the cooperative FAKT, only one out of every ten persons who come to a cooperative understands how prices are established. But the same FAKT undertook a study which showed that the percentage of people who think that cooperatives are a necessary thing is growing from month to month. The number of contacts between the public and cooperatives is increasing, as is the number of persons who would like to work in a cooperative. All of this and many other factors is contributing to a higher level of public consciousness about economics.

The decree is damaging not only because it prohibits something. The consequences of that ban could result in criminal overtones in the immediate future. Thus, there have already been cases where cooperatives have been forced to pay out a significant portion of their profits to state enterprises. Simply because they signed a contract. One can only imagine what will be the result of delegating authority to the councils of ministers of the union republics "to determine, when necessary, what other types of activity this includes (in addition to those stipulated in the present decree)." And how many cooperative operators, out of fear about what tomorrow will bring, will be forced to earn money at any price? What about their reputations, if perhaps tomorrow dozens more types of activities are prohibited?

We can have "civilized cooperative operators" only if conditions for survival are civilized. We do not yet have such conditions for the cooperative system. The regulatory levers are still the same ones we had before.

Soviet Dependence on Imported Drugs

18400443 Moscow SOVETSKAYA TORGOVLYA in Russian No 38, 28 Mar 89 pp 4-5

[Article by Mariya Shteyn: "A Most Painful Shortage"]

[Text] **Were it not for annual import of 500 different preparations, our medicine would be paralyzed to a significant extent.**

Each year the country spends around 1 billion rubles on the production of Soviet toxic chemicals.

In 1987 we purchased pesticides worth 500 million rubles from foreign countries.

In 1989, 1.1 billion rubles were allocated for medicinal preparations. Another 500 million rubles would be required in order to completely satisfy the population's demand for drugs.

First deputy general director of the All-Union Soyuzfarmatseya Association under the USSR Ministry of Health O. Volkov:

"Our pharmaceutical industry is furnished with worn and obsolete equipment. Take for example the plant in Volgograd—the only one in the country making mustard plasters. Even its products have now become highly scarce.

"In the last 10 years the USSR Ministry of Medical and Microbiological Industry has not built a single plant.

"Is it not surprising, then, that Soviet drugs, which produce excellent results in laboratory research, are significantly inferior to foreign analogs when industrially produced?

"In 1987 the inspection service of the pharmaceutical administration filed 152 complaints against enterprises of the Ministry of Medical and Microbiological Industry and rejected 81 different drugs. And in 1988 the number of complaints was 195, with 68 different drugs manufactured at 27 enterprises being rejected. At the top of the list of waste-makers are the Dnepropetrovsk and Tashkent chemical and pharmaceutical plants, the Kaunas Endocrine Drug Plant and the Lvovfarm and Belmedpreparaty associations."

The principal supplier of drugs in our country is the USSR Ministry of Medical and Microbiological Industry. According to a report from the All-Union Soyuzfarmatseya Association of the USSR Ministry of Health, the average annual rate of growth of its production has decreased **from 5.9 percent in 1980-1985 to 4.5 percent in 1985-1988.**

The demand of public health is only 45 percent satisfied by Soviet-produced drugs, while with regard for imported purchases, it is 75 percent satisfied.

Of the 2,363 different drugs for which the USSR Ministry of Health placed orders in 1988, 1,659—that is, 70.2 percent—have been supplied in full.

The unsatisfied demand for drugs in 1980 totaled 707 million rubles, in 1985 it was 716 million rubles, and this year it will attain 1.25 billion rubles.

Last year the demand for drugs **for treatment of cardiovascular diseases was satisfied:** 30.7 percent by Soviet industry, and 87.6 percent with regard for imported purchases.

Vitally necessary drugs that are not made by Soviet industry and are purchased entirely from foreign countries include:

prolonged forms of nitroglycerin—nitrong, sustac, sustanit;

cardiostimulators—finoptin, cordarone, korinfar;

antiarrhythmic—ritmilen, kinelintin;

hypertensive—adelfan, kristepin, reserpine, dopegyt.

The demand **for antibiotics** was 77.9 percent satisfied during the year (with regard for imports).

Antibiotics with a wide spectrum of action are especially lacking. The country has still not organized production of antibiotics of the so-called cephalinosporin series for injection. The demand for them is 33 percent satisfied due to purchases from foreign countries.

According to data of the World Health Organization, in 1986 cephalinosporin represented 46 percent of the demand for antibiotics in developed countries, while in the USSR it represented less than 1 percent.

An alarming situation has evolved with the most important group of preparations **for treating patients with sugar diabetes—insulins.** For a number of years doctors have received 20 percent less insulin than that required to save the lives and health of patients.

The situation is aggravated by the fact that Soviet plants produce insulin of low quality; it often elicits allergic reactions and diabetic complications. In 1988 the USSR Ministry of Health increased foreign purchases of highly purified insulins by more than a factor of two, but this did not alleviate the acuity of the problem.

The demand for drugs is now satisfied:

for treatment of oncological patients (with regard for imports)—by 88.2 percent, **for treatment of brain diseases and nervous disorders**—by 83.9 percent.

Around 80 drugs of this group are being purchased abroad.

Soviet industry is not producing modern, highly effective psychotropic drugs.

The demand for blood substitutes and plasma-substituting solutions is satisfied by less than 63.5 percent.

Due to a shortage of albumin, protein, rheopolyglucin and neohemodes, it is impossible to attain total success in the fight against child mortality in republics of Central Asia and Kazakhstan.

Medicine is supplied an average of 45 percent of its demand for drugs by which to prevent and treat dysbacteriosis.

This disease develops in connection with wide use of chemotherapeutic drugs, and children are especially susceptible to it.

Providing hospitals with disposable systems for transfusion of blood, blood substitutes and infusion solution is a highly acute problem. In 1988 38.0 million units were delivered—35 percent of the number ordered. This year 39 million units have been allocated in the presence of a demand of 150 million. They are needed not only as a way to reduce the level of infectious diseases, but also as one of the means of preventing the spread of AIDS.

The demand for **X-ray contrast media** necessary for early diagnosis of malignant tumors and other dangerous illnesses is 60 percent satisfied. The activities of diagnostic centers opening for the first time will be practically paralyzed.

There is a shortage of children's drugs, especially for newborn infants and nursery-school age children. Of the 200 drugs needed in pediatrics, 140 are actually used (including 43 imported drugs).

All of the drug problems—inadequate assortment, poor quality and a general lack of them—are aggravated even more by a lack of storage facilities and the low level of their equipment. The availability of pharmaceutical management systems in warehouses is 25.1 percent of the demand in the country as a whole, and 13 percent in Moscow.

The per-capita demand for medicines and drugs in our country is 13 rubles 80 kopecks. This is the lowest indicator among the world's developed countries. It is six to eight times higher in the USA, Japan and the FRG.

UDC 616.1/.8-084(47+57)

Development of Integrated Program To Prevent Noninfectious Diseases

18400488a Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 61 No 1, Jan 89 (manuscript submitted 18 Mar 88) pp 6-8

[Article by R. G. Oganov, I. S. Glazunov, A. V. Ivanov, and V. I. Grabauskas, All-Union Preventive Medicine Scientific Research Center, USSR Ministry of Health, Moscow]

[Text] The all-union conference titled "Coordination of the Integrated Program To Prevent Noninfectious Diseases in the USSR" was held in Palanga from 20 to 22 January 1988.

The conference agenda included reports from eight participating centers and a discussion of further joint actions to implement the program.

A. P. Grishkyavichus, first deputy minister of health of the Lithuanian SSR, emphasized the importance of preventing various diseases and expressed his certainty regarding the need to consolidate the efforts of scientific institutions in order to optimize the prevention-related activity of health care organs. Subsequent addresses (by R. G. Oganov and V. I. Grabauskas) presented the theoretical and practical basis of the integrated program and traced the main stages of its development in the country. The presenters noted that the member nations of the World Health Organization are busy developing and introducing strategies known as "Health for All by the Year 2000." One of the directions for achieving this goal is an integrated approach to preventing noninfectious diseases. The approach is based on data involving the similarity of the links between risk factors and a number of illnesses: ischemic heart disease, cerebral insult, chronic nonspecific lung diseases, cancer, diabetes mellitus, etc. The existing evidence of the possibility of correcting risk factors to fight this group of diseases opens new perspectives for preventive medicine and society as a whole. Implementation of the integrated program is based on combining the resources used to prevent individual noninfectious diseases and to eliminate the risk factors associated with them. An important aspect of this area consists in the combined efforts of the state and social organizations of various regions, ministries, and departments. Realizing the program now requires individualization of the forms of its implementation. The conference was primarily devoted to solving these problems.

The main goal of the integrated program is to strengthen public health and reduce the levels of mortality, disability, and morbidity that are related to cardiovascular and other noninfectious diseases. This program has aroused the interest of World Health Organization member nations, and an agreement regarding cooperation among Austria, Bulgaria, the CzSSR, Hungary, Iceland, Malta, Finland, the FRG, Yugoslavia, and the USSR (the SINDI [not further identified] program) has been signed. In our country the Lithuanian, Estonian, and Latvian union republics and Moscow, Novosibirsk, Minsk, Frunze, and Kharkov are participating in developing the program. The Center for Preventive Medicine of the USSR Ministry of Health is coordinating these programs in the USSR and in Europe.

The reports by the representatives of the program's participating centers were devoted to its foundation, objectives, and structure as well as to measures for preventive action and their initial results.

In the Lithuanian SSR a program has been under way since 1982 (director, I. I. Platukis). In the structure of the overall mortality of the republic's population, the percentage of mortality due to cardiovascular diseases and cancer is 60 percent. Based on data from an examination of about 4,000 inhabitants of Kaunas and rural rayons, 25 percent of the population has arterial hypertension, 20-25 percent have high cholesterol levels, 25 percent of males and 44 percent of females are overweight, and 40 percent of men and 5 percent of women smoke. No sharp differences were established in the prevalence of risk factors among the urban and rural populations. The program is directed by the republic's Ministry of Health, together with an interdepartmental council and the republic preventive medicine center. A 7-percent reduction in the prevalence of arterial hypertension is slated for the next few years, as are a 4-percent reduction in smoking and a 7-13 percent reduction in obesity. Preventive measures are being conducted among the adult and pediatric populations of Kaunas and five rural rayons. Data on a reduction in the incidence of caries in children under 12 over a five-year period were presented as an example of the effectiveness of preventive measures.

In the Belorussian SSR the population of one of the rayons of Minsk was selected for observation. The republic's Ministry of Health and Belorussian Cardiology Scientific Research Institute (G. I. Sidorenko) direct the program. An initial examination of the population is now being conducted, and data on health indicators are being collected. Prophylactic measures are being planned for the current year. The goal of the program is to reduce overall mortality by 3 percent (death due to myocardial infarction by 5 percent and death due to cerebral insult by 10 percent) and to reduce temporary disability by 5-7 percent. Plans also call for reducing the prevalence of arterial hypertension by 2 percent in the next three years and to reduce smoking and high cholesterol by 2-4 percent.

The integrated program to prevent noninfectious diseases in Moscow is being developed by the Center for Preventive Medicine of the USSR Ministry of Health among the general population (director, L. V. Chazov). Research is being conducted in two rayons of Moscow. The program began in 1985 and is being administered by the Coordination Council, with the participation of soviet and party organizations, scientific research institutes, and institutions involved in practical health care. An assessment study that was conducted made it possible to identify ischemic heart disease in nearly 18 percent of the inhabitants of the rayon, arterial hypertension in 30 percent, chronic bronchitis in 9 percent, diabetes mellitus in 4 percent, obesity in 36 percent, and high cholesterol in 18 percent. Plans call for reducing by 1990 morbidity due to arterial hypertension to 23 percent, smoking to 35-50 percent, and obesity to 15 percent in males and to 35 percent in females. Plans also call for considerably more information to be given to the public regarding the risk factors and prevention of noninfectious diseases. Great importance is being attached to the training of medical and teaching personnel. The Center for a Healthy Lifestyle has been set up, and similar offices have been established in the rayon's polyclinics.

A specially organized laboratory of the Center for Preventive Medicine is developing and introducing an integrated

program among an organized population that, in the first stage, is represented by six enterprises of the USSR Ministry of Heavy, Power, and Transport Machine Building (director, I. S. Glazunov). The basis for conducting this program in that sector is the significant percentage of noninfectious diseases in the structure of the work loss among the workers' (up to 70 percent). The program is expected result in a significant increase in the effectiveness of the treatment of arterial hypertension (with a normalization of blood pressure in no less than 25 percent of all persons with arterial hypertension), a 10-percent reduction in the number of smokers, and 5-percent reductions in obesity and hypercholesterolemia. Plans also call for stabilizing the progression of ischemic heart disease and chronic nonspecific lung disease. The sector Coordination Council in various regions of the country (in Moscow and the Moscow Oblast, Kalinin, Sverdlovsk, Tashkent) is administering the program. The combination of population, group, and individual methods and the consolidation of the administrative, social, and medical structures of the sector and individual enterprises underlies the preventive measures. It has been proposed that in the second and third stages of the introduction of the program, the preventive measures be extended to all of the sector's enterprises and that a standard plan be developed for other industrial ministries. The results of an examination of 8,000 persons that was conducted at five enterprises showed a high incidence of the following risk factors: arterial hypertension was established in 15-35 percent of the workers; up to 70 percent of the men and 13 percent of the women smoke; high cholesterol levels were found in 12 percent; and obesity was found in 15 percent of the men and 35 percent of the women. Between 8 percent and 12 percent of the workers suffered from ischemic heart disease and chronic bronchitis. Preventive measures include an automated system to develop individual conclusions—recommendations and conclusions for physicians based on the examination results; training of medical personnel; and the dissemination of more information in the labor collectives regarding the safeguarding of one's health.

In Novosibirsk, the population participating in the program consists of men and women from two rayons of the city. The program (director, Yu. P. Nikitin) is being conducted simultaneously with the fulfillment of the requirements of the registry of acute myocardial infarction and the program MONIKA [not further identified]. It is proposed that the prevalence of arterial hypertension be reduced to 28 percent, that smoking in men be reduced to 50 percent, and that the frequency of hypercholesterolemia and obesity be reduced. Plans call for reducing mortality due to noninfectious diseases by 10 percent.

In the Latvian SSR the program is set up in five experimental rayons and five control rayons (with each group of rayons containing 300,000 persons). Intervention will also be provided for pregnant women and children under the age of 15. The preventive program is being administered by soviet and party organs of the rayons, in conjunction with the the CPSU Central Committee and republic's Council of Ministers. Reducing the incidence of diseases of the oral cavity and the teeth in children and adults has also been given an important place in the program.

In the Estonian SSR (report by I. O. Volozh) as many as 100 new cases of noninfectious diseases per 1,000 population are recorded each year. The program is being conducted at nine industrial enterprises of Tallin, and in the future it will be expanded to include all children and adults in the republic's capital. A special organ within the republic's Ministry of Health has been created to direct the program. According to data from an epidemiological study, chronic bronchitis has been established in 18 percent of all men and 10 percent of women, ischemic heart disease in 10 and 15 percent, arterial hypertension in 39 and 24 percent, and obesity in 17 and 22 percent, respectively. The program calls for reducing mortality due to noninfectious diseases throughout the republic by 10 percent over a 15-year period and for reducing overall mortality by 5 percent.

In the Ukrainian SSR, an integrated program is being developed by the republic's Therapy Institute (director, L. T. Malaya) and is being conducted at Ministry of Heavy and Power Machine Building enterprises located in the UkSSR. In the next 3 years, the number of smokers is expected to be reduced by 10 percent, arterial hypertension will be reduced by 25 percent, and the lack of exercise among the population will be reduced by 20 percent. These measures envisage a stabilization of the progression of diseases and the frequency of their complications by 10 percent. At the present time, arterial hypertension has been established in 17 percent of workers, obesity has been established in 24 percent of men and 28 percent of women, and 27 percent of men smoke.

As a result of the discussion of the reports, the conference participants deemed it necessary to intensify preventive measures in all regions, and they identified the main problems requiring theoretical and practical solution. Implementing interdependent elements—the initial period, practical implementation, and assessment and monitoring of the implementation in different regions—requires careful coordination. The integrated program's Coordination Center—which is the head organization, i.e., the Center for Preventive Medicine of the USSR Ministry of Health—is responsible for the joint work. The republic ministries of health, the chairmen of the interdepartmental councils on prevention, and the directors of the institutes are also program coordinators. The conference participants affirmed the main points of the program's structure, which includes (1) a minimal set of risk factors, (2) no fewer than two groups of noninfectious diseases, (3) the organization of a health care service, and (4) interdepartmental cooperation. The conference also affirmed that the following parameters should be assessed and monitored: the screening of random population samples, which includes measurement of risk factors and the incidence of the main pathological conditions; medical statistical indicators; and record-keeping (more accurate registration) of the main noninfectious diseases. In critically assessing the possibility of using

data from official medical statistics in epidemiological prevention-related research, the conference participants admitted that, for the purposes of the program, information that is approximate but timely can be more important than late-arriving, precise information. It is advisable to use these approximate indicators to assess the epidemiological situation in individual populations until more accurate records are introduced. The concept of the preventive intervention module, which is an independent subprogram suitable for reproduction in different regions, was introduced for purposes of program development. The goals, cohorts, methods of action, and criteria for assessing results were specified as the main components of the module.

In the first stages, the conference participants deemed it advisable to develop and coordinate methods of fighting smoking, arterial hypertension, and weight gain and poor nutrition.

The techniques for monitoring health (with specification of a system of indicators at the population level) and the evaluation of efforts related to prevention (with specification of a set of parameters indicating the magnitude of the effect of the preventive measures on the public) were adopted as priority areas in assessing the program. The search for algorithms to assess the relationship between the preventive measures and the change in the levels of health indicators (risk factors, disability, morbidity, and mortality) is also an important task. These and other aspects of the development of data base organization and support should create the opportunity for comparing the various regions in terms of the results of the work to introduce the integrated program. Assessing the program is an integral part of the process of administering it. It is therefore necessary to solve the following local organizational problems: standardization of record-keeping documents; preparation of information centers for a minimal level of data base organization and support and for the performance of analyses based on standard questionnaires; and coordination of data processing methods and algorithms.

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10-Year Trends in Acute Cardiovascular Morbidity in Open Population

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[Text] Considering the different directions of the trends in the change in morbidity due to coronary heart disease in different countries,[8-10] such trends must be studied over a protracted period based on standard programs developed by the World Health Organization (WHO) and with the selection of a stable research population.

The standard programs for studying morbidity due to coronary heart disease have changed over time. The problem of the possibility of comparing these programs has not been studied adequately.

The purpose of the present work is to study the 10-year trends in acute cardiovascular morbidity in the population and to compare the old and new WHO standard programs for researching coronary heart disease in one and the same population.

The program used is titled "Acute Myocardial Infarction Register." It was proposed by the WHO in 1969,[7] and it has been used as the basis for a study in one of the rayons of Novosibirsk (Oktyabrskiy) since 1 January 1977 and in two other rayons of the city (Leninskiy and Kirovskiy) since 1 January 1981. Since 1 January 1984, research based on the WHO program "Monitoring Trends in Cardiovascular Diseases and Factors Determining Them" (which was developed in 1983[11]) has been conducted on the populations of those same three rayons.

The initial research in the Oktyabrskiy Rayon was begun in view of the fact that, in our view, it was a typical city rayon. To refine the research, a comparative study examined the morbidity among the 25-64 age group in three rayons of the city (from 1 January 81 through 31 December 1987; Table 1). Over a six-year period, 5,766 cases of acute myocardial infarction were recorded in those rayons. Over that entire period, differences in the morbidity of the population of the rayons were noted. With the exception of 1986, the highest morbidity in both sex groups per 1,000 inhabitants was in the Kirovskiy Rayon. Average morbidity was observed in the Oktyabrskiy Rayon. These data agree with the findings of other authors.[1,4] The morbidity per 1,000 inhabitants in the three rayons by year was as follows: 1981, 3.27; 1982, 3.39; 1983, 3.40; 1984, 3.32; 1985, 3.62; and 1986, 3.39. It is obvious that the closest indicators to these were obtained in the Oktyabrskiy Rayon.

Table 1.
Morbidity due to Myocardial Infarction Per 1,000 Inhabitants in the 25-64 Age Range in Relation to Age and Sex in Three Rayons of Novosibirsk

Age, in years	Sex	Year of Research																	
		1981			1982			1983			1984			1985			1986		
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
25-34	M	0.9	0.63	0.52	0.66	0.2	0.62	0.41	0.4	0.24	0.31	0.31	0.33	0.32	0.21	0.27	0.24	0.1	0.27
	F	0.15	0.1	0.04	0.07	0.08	0	0	0	0.04	0.07	0	0.04	0	0	0	0.07	0	0
35-44	M	3.6	1.9	2.2	3.1	2.9	3.1	2.1	4.5	2.9	3.2	2.2	1.9	4.5	5.8	1.7	3.9	3.1	1.8
	F	0.1	0.6	0.1	0.8	0.1	0.3	0.5	0.1	0.2	0.4	0.1	0.2	0.6	0	0.3	0.6	0	0.2
45-54	M	9.3	9.4	8.6	8.9	8.5	8.8	9.8	6.6	5.7	8.6	7.8	5.4	8.6	9.3	7.4	9.1	4.9	6.8
	F	2.1	2.1	1.5	2.2	1.9	1.6	3.2	1.7	1.8	3.2	1.5	1.1	1.7	1.4	2.1	1.3	1.1	1.2
55-64	M	21.6	19.1	11.2	20.7	15.2	11.2	15.1	18.3	14.7	19.6	16.4	14.9	22.7	11.2	14.5	22.0	10.9	17.2
	F	7.5	7.9	7.0	9.0	5.0	7.0	10.2	6.5	5.7	7.5	5.4	5.7	9.2	7.0	7.0	8.4	6.9	7.5
25-64	M	6.3	5.5	4.9	6.2	5.3	4.9	5.3	5.7	4.6	6.3	5.4	4.4	6.9	5.5	4.6	6.8	4.0	4.9
	F	1.8	1.9	1.9	2.5	1.6	1.7	2.8	1.8	1.7	2.5	1.3	1.6	2.4	1.8	1.9	2.2	1.7	1.7

Note: 1—Kirovskiy Rayon; 2—Oktyabrskiy Rayon; 3—Leninskiy Rayon

Table 2 presents the results of a 10-year study of morbidity due to acute myocardial infarction in the Oktyabrskiy rayon among the population in the 25-64 age group. Over that period (from 1 January 1977 through 31 December 1986), 2,069 cases of acute myocardial infarction were recorded.

Table 2.
Morbidity due to Acute Myocardial Infarction per 1,000 Inhabitants Aged 25-64 in the Oktyabrskiy Rayon of Novosibirsk

Year of Research	Age group, in years														
	25-34			35-44			45-54			55-64			25-65		
	M	F	Both	M	F	Both	M	F	Both	M	F	Both	M	F	Both
1977	0.1	0	0.04	1.25	0.43	0.79	7.9	2.31	4.61	13.44	6.98	9.44	4.32	2.19	3.09
1978	0.31	0	0.14	1.88	0.43	1.02	8.37	1.98	4.6	12.98	7.4	9.53	4.53	2.13	3.19
1979	0.32	0.09	0.19	5.41	0.19	1.86	7.38	1.93	4.47	15.89	7.42	8.82	5.22	1.72	3.25
1980	0.52	0.09	0.29	3.3	0.3	1.35	9.53	1.66	5.15	17.89	6.62	10.7	5.57	1.61	3.31
1981	0.63	0.09	0.34	1.89	0.55	1.0	9.38	2.13	5.34	19.12	7.98	11.97	5.5	1.95	3.47
1982	0.2	0.08	0.13	2.89	0.13	1.27	8.53	1.88	4.86	15.21	4.97	8.92	5.32	1.57	3.24
1983	0.4	0	0.17	4.5	0.13	1.2	6.6	1.66	4.48	18.3	6.49	11.04	5.71	1.8	3.54
1984	0.31	0	0.14	2.15	0.13	0.89	7.78	1.52	4.35	16.35	5.4	9.69	5.43	1.54	3.23
1985	0.21	0	1.33	5.8	0	1.33	9.25	1.35	4.85	11.16	7.01	9.61	5.48	1.76	3.48
1986	0.1	0	0.05	3.09	0	0.95	4.95	1.14	2.83	10.85	6.87	9.38	4.01	1.68	2.81

Over the span of all the years of study, the researchers noted a statistically reliable increase in morbidity with age in both sex groups ($p < 0.01$ and $p < 0.05$). It was discovered that the morbidity in men is twofold to fourfold higher than that of women in all age groups.[2,5,6] The greatest increase in morbidity as compared with the preceding age group was observed in the 45-54 age range both among men (3- to 5-fold) and among women (5- to 10-fold).

We analyzed the morbidity dynamics by year. The total morbidity in 1977 amounted to 3.09 per 1,000 inhabitants. An increase in morbidity was observed up until 1981. Beginning in 1982, however, it stabilized. A trend toward a reduction in morbidity to 2.81 per 1,000 inhabitants was identified in 1986. An increase in the morbidity among men was determined up until 1980. After that, however, it stabilized. In 1986 a trend toward a reduction in morbidity appeared. A trend toward a reduction in morbidity was recorded for women from 1977 through 1980; then it stabilized. These results confirm the presence of a stable morbidity from 1981 through 1986, both in the city's remaining rayons and for the three rayons together. Thus, the rayon selected for

long-range monitoring is typical for Novosibirsk, and the trends in morbidity due to myocardial infarction among its population are objective. A trend toward an initial increase in morbidity followed by stabilization and then, beginning in 1986, toward a reduction in morbidity has been established on the basis of prospective observation. These dynamics are primarily determined for men. It should be noted that the active prevention of cardiovascular diseases is under way in the Oktyabrskiy Rayon. In that rayon, a rayon preventive medicine department has operated since 1981, the year it was set up. The possibility that the six-year work with the rayon's medical services and the involvement of nonmedical organizations in prevention was responsible for a reduction in morbidity due to myocardial infarction—a reduction not found in the remaining two rayons—has not been excluded. The fact that a trend toward a reduction in morbidity was noted in the youngest age group (25-34) and oldest (55-64) during 1984-1986 is noteworthy. These data coincide with the results of other authors in the sense that either an increase or a reduction in morbidity is noted primarily in these age groups.[9,10]

A comparative analysis of the programs "Acute Myocardial Infarction Register" and "Monitoring Trends in Cardiovascular Diseases and Factors Determining Them" is very interesting. Over the span of the year 1984 in the three rayons of Novosibirsk, 948 cases of "determined" and "possible" myocardial infarction were recorded in the first program among the population aged 25-64 years, whereas 938 cases were recorded in the second program.

The morbidity per 1,000 inhabitants according to the first and second programs amounted to 5.2 and 5.1 cases for men and 1.8 and 1.9 cases for women, respectively (Table 3). No differences between the two programs were noted in the identification rate of the diagnostic categories of myocardial infarction for either men or women in the 25-29 and 40-44 age groups ($p > 0.05$). In the 45-49 and 60-64 age groups the predominance of the diagnostic category "possible myocardial infarction" ($p < 0.001$ and $p < 0.01$) was noted in both sex groups both in the first and the second program. A trend toward the prevalence of the diagnostic category "determined myocardial infarction" (1.32 and 1.01 per 1,000 inhabitants, respectively) was noted for all sex and age groups for both programs ($p > 0.05$). An opposite trend was found for the diagnostic category "possible myocardial infarction"—2.04 and 2.28 per 1,000 inhabitants, respectively ($p > 0.05$). Consequently, the differences in morbidity indicators found when the research was conducted in accordance with the first and second programs are quite insignificant. The trend toward the predominance of the diagnostic category "determined myocardial infarction" in the study based on the first program is explained by the fact that the protocol of the second program includes restrictions on the establishment of this diagnosis, and in view of this, the increase in the percentage of the category "possible myocardial infarction" in the second program is natural. These differences are negligible, however.

Table 3.
Morbidity due to Acute Myocardial Infarction per 1,000 Inhabitants Aged 25 to 64 Years, Totaled for Three Rayons in 1984

		Diagnostic Category				Total	
		"Determined Myocardial Infarction"		"Possible Myocardial Infarction"			
Age Group, in years	Sex	1	2	1	2	1	2
25-29	M	0.05	0.05	0.05	0.05	0.09	0.09
	F	0	0	0	0	0	0
	Both	0.02	0.02	0.02	0.02	0.04	0.04
30-34	M	0.27	0.18	0.27	0.36	0.54	0.54
	F	0	0	0.08	0.08	0.08	0.08
	Both	0.13	0.08	0.17	0.21	0.29	0.29
35-39	M	0.89	0.67	1.01	1.17	1.9	1.85
	F	0.05	0.09	0.15	0.14	0.2	0.23
	Both	0.45	0.37	0.55	0.6	1.0	0.97
40-44	M	1.2	1.2	1.61	1.29	2.81	2.49
	F	0.07	0.07	0.21	0.14	0.28	0.21
	Both	0.6	0.6	0.86	0.67	1.46	1.27
45-49	M	2.25	1.57	3.71	4.87	5.96	6.44
	F	0.36	0.23	0.81	1.0	1.17	1.23
	Both	1.2	0.83	2.1	2.5	3.3	3.33
50-54	M	3.43	2.68	5.22	6.26	8.65	8.94
	F	0.84	0.89	1.91	2.21	2.75	3.1
	Both	1.99	1.69	3.38	4.01	5.36	5.7
55-59	M	6.1	4.64	9.5	10.12	15.6	14.76
	F	1.72	1.17	2.79	3.34	4.51	4.51
	Both	3.57	2.63	5.62	6.21	9.19	8.84
60-64	M	7.52	5.47	10.12	11.48	17.64	16.95
	F	3.05	2.84	5.53	5.89	8.58	8.73
	Both	4.61	3.75	7.12	7.83	11.73	11.58
25-64	M	2.09	1.59	3.13	3.45	5.2	5.1
	F	0.63	0.54	1.2	1.34	1.8	1.9
	Both	1.32	1.01	2.04	2.28	3.3	3.3

Note: Here and in tables 4 & 5, 1 = "Acute Myocardial Infarction Register" and 2 = "Monitoring Trends in Cardiovascular Diseases and Factors Determining Them"

The indicators of mortality rate and lethality [ratio of those who die from a condition to those who survive it] were also compared. Two hundred eighty-one cases with a fatal outcome were determined according to both programs. The mortality rate per 1,000 inhabitants amounted to 98.5 (Table 4), and the lethality amounted to 29.6-29.9 percent (Table 5) according to both the old program and the modified program. The indicators of mortality rate and lethality are identical in almost all age groups for both programs, and when differences do exist, they are negligible ($p > 0.05$).

Table 4.
Deaths due to Acute Myocardial Infarction per 100,000 Inhabitants Aged 25-64, Totalled for Three Rayons in 1984

Age Group, in years	Sex	Program 1	Program 2
25-29	M	4.56	4.56
	F	0	0
	Both	2.12	2.12
30-34	M	13.54	13.54
	F	3.89	3.89
	Both	8.36	8.36
35-39	M	50.4	50.4
	F	0	0
	Both	23.62	23.62
40-44	M	88.35	88.35
	F	7.01	7.01
	Both	44.93	44.93
45-49	M	168.73	168.73
	F	18.02	18.02
	Both	85.04	85.04
50-54	M	275.95	275.95
	F	95.5	95.5
	Both	175.72	175.72
55-59	M	471.44	409.04
	F	106.42	106.42
	Both	260.55	260.55
60-64	M	382.83	410.17
	F	261.83	261.83
	Both	303.85	313.35
25-64	M	158.71	158.71
	F	50.01	50.01
	Both	98.5	98.5

Table 5.
Lethality of Acute Myocardial Infarction by Age Group, Totalled for Three Rayons in 1984

Age Group, in years	Sex	Program 1	Program 2
25-29	M	50.0	50.0
	F	0	0
	Both	50.0	50.0
30-34	M	25.0	25.0
	F	50.0	50.0
	Both	28.57	28.57
35-39	M	26.47	26.47
	F	0	0

Table 5.
Lethality of Acute Myocardial Infarction by Age Group, Totalled for Three Rayons in 1984 (Continued)

Age Group, in years	Sex	Program 1	Program 2
	Both	23.68	23.68
40-44	M	31.43	35.48
	F	25.0	33.33
	Both	30.77	35.29
45-49	M	28.3	28.3
	F	15.38	14.81
	Both	25.75	25.56
50-54	M	31.9	30.83
	F	34.78	30.77
	Both	32.72	30.84
55-59	M	30.22	27.7
	F	23.59	23.59
	Both	28.34	26.49
60-64	M	21.7	24.19
	F	30.51	30.0
	Both	25.91	27.05
25-64	M	30.65	31.51
	F	27.33	26.6
	Both	29.64	29.95

Thus, a comparison of the indicators of morbidity, mortality rate, and lethality obtained during research conducted in accordance with the WHO programs "Acute Myocardial Infarction Register" and "Monitoring Trends in Cardiovascular Diseases and Factors Determining Them" showed that there are no appreciable differences between the indicators presented above. This makes it possible to compare indicators obtained from research conducted in accordance with the first and second programs on different populations.

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Republic Diagnostic Center Opens in Baku

18400489b Moscow IZVESTIYA in Russian 18 Apr 89 p 2

[Article by correspondent A. Dzhalilov: "A Polyclinic With No Lines"]

[Text] **A republic diagnostic center that is not inferior to world analogues in availability of unique microprocessor and computer equipment has opened in Baku. To make certain of this, our correspondent in Baku went to the center as a patient.**

A series of "pleasant discoveries" follows you up all five stories, beginning on the ground floor, where the X-ray department is located, and ending with the "winter garden"—a natural green oasis with ornamental fountains, artfully "embedded" in the middle of the building between the second and fourth floors.

The X-ray department has the latest Soviet and foreign equipment making it possible to carry out a high level of analysis of digestive organs in a lighted room (without having to darken it). All five machines are equipped with monitors, and electron-optic transducers make it possible to magnify the image by several thousand times, which significantly reduces the radiation load upon patients and service personnel.

The complete absence of "white light," which dominates the light spectrum in the interiors of ordinary medical institutions, is also interesting. In this regard not one floor reserved for a given department (there are five of them altogether) is similar to any other in decoration and design. The arrangement of the offices and services and the unique equipment and apparatus with which they are furnished had been thought out down to the finest details.

You will not see the usual lines here, even though the center is designed to accommodate 1,000 persons per shift. The computerized visitor servicing system makes it possible to avoid such lines. Every floor (department) is equipped with a dispatcher's console—a Korvet personal computer (manufactured in Baku) serviced by the duty nurse. When a patient comes to her, she queries the corresponding doctor's office and sets up an appointment for the patient on a precise date and at a precise time, or escorts him to the examining room on the spot. Let me note incidentally that the center employs 530 persons, of whom 171 are doctors and 30 are engineers; more than half are nurses and medical assistants. Administrators make up the smallest group. There are 15 of them, headed by the director.

Hand-carrying my medical record, I took the elevator to the fourth floor, where a polyclinic and a laboratory for integrated preliminary examination are located. In 15 minutes (I timed it) they measured my height, weight and blood pressure, recorded an electrocardiogram and determined my blood group and Rh factor. Another 10 minutes were taken up acquiring other data by quick methods.

In the usual polyclinic this would have required several hours, or even days.

The center has two Philips computer-assisted tomographs that can be used to reveal the early stages of disease and detect even the most insignificant deviations from the norm. Ultrasonic and radio-isotope analysis methods make it possible to obtain valuable and necessary information on the status of internal organs and systems. Use of these methods provides a possibility not only for determining with high accuracy the degree and nature of illness but also to predict its outcome and to offer a prognosis of its development.

For Azerbaijan, in which just quite recently the per-capita outlays on public health were the lowest in the country, and in which only 9 out of 79 city hospitals more or less satisfy modern requirements (rural hospitals are something else altogether), the opening of such a center is very symptomatic. It is a very visible product of the recently adopted large-scale "Health" program, which proposes to dramatically increase the level of medical service, reinforce the sector's material and equipment base, and finally, restore the reputation of Azerbaijani doctors, in the very next few years.

All of this is so. But as I left this fairy castle, which begged to be called a "proving ground for and an exhibition of" the most contemporary medical and computer technology, a thought forced its way into my mind: Is there the danger that it will become nothing more than a showcase of bureaucratic vanity, a unique sort of promise to render services in selected situations?

"Those days have long since gone," replied center director O. Shiraliyev without even a hint of insult in his voice. "Professional honor would not allow it."

Poor Food Quality Associated with Gastrointestinal Disease

18400520a Moscow SOVETSKAYA KULTURA in Russian 20 Jun 89 p 1

[Article by K. Sergiyenko, under the rubric "Quick Analysis": "From the Dining Hall to the Hospital?"; first paragraph is introduction in source]

[Text] **Every day, more than 190,000 persons in our country do not go to work because of illness associated with the digestive organs.**

Here is one more alarming figure: Just in 1987 alone, 5.6 million patients were recorded with gastric and duodenal ulcers, atrophic gastritis, gallstone disease and cholecystitis. In the opinion of specialists, all of these illnesses are chiefly the result of poor-quality food. The USSR State Committee for Statistics, which published these data, conducted a selective survey on the quality of the work of public food-service enterprises in a number of the country's regions.

More than 130 million persons make regular use of public food services, but only 22 million are able to do so at any one time.

The organization of public food services remains unsatisfactory. The hours of the enterprises are inconvenient, and the assortment of dishes is limited. Such is the opinion of practically all interviewees.

But all of this, even if it is significant, is still only half the problem. The main thing is the kind of food products that we are eating. The dining halls get low-quality food products, as a rule. And sometimes they are simply unusable. Inspections revealed that one out of every three dishes tested did not satisfy the calorie requirements, and one out of every four did not satisfy the required vitamin content. And a high concentration of nitrates was detected in one out of every six tests of vegetables, fruits and melons.

This lack of conformity to sanitary norms is the main cause of intestinal illnesses. Thus, around two million cases were recorded last year, which is 8 percent more than the average of several previous years.

Alarming Tuberculosis Situation

18400520b Moscow NEDELYA in Russian
No 20, 15-21 May 89 p 8

[Article by Leonid Chuyko, under the rubric "Health Service: We're Sounding the Alarm": "Koch's Insidious Bacillus"]

[Text] Our doctors declared proudly 25-30 years ago that tuberculosis had been conquered in the country once and for all. And they cited impressive figures as confirmation: The overall mortality due to this disease had been decreased by a factor of 20, while child mortality had been decreased by a factor of 150.

But "suddenly" astounding facts are coming to light. Today over half a million persons are stricken with tuberculosis in the country. Each year, another 100,000-150,000 patients are identified with a so-called first-time diagnosis of active tuberculosis. The mortality due to this ailment is higher than that due to all other 37 infectious diseases combined.

Why has Koch's malevolent bacillus returned to life?

"A while back, we made a serious concession to this insidious and dangerous disease," said Doctor of Medical Sciences A. A. Priymak, professor and director of the Moscow Scientific Research Institute of Tuberculosis. "Our reasoning was this: once the social roots of tuberculosis were eradicated, it would no longer be dangerous."

Things started going "backwards" when, in the mid-1950s, X-ray technology and various antibacterial drugs made their way extensively into Soviet medicine. It was decided at that time that tuberculosis could be eliminated in the country within the next few years. It was for this reason that finances supporting the development of phthisiology—the science of the treatment of tuberculosis—were cut considerably, and specialist training was cut back.

In the meantime the disease got a "second wind" in the last 10-15 years. There are many reasons for this. There was a change in food quality—not for the better, alas. Today increasingly larger quantities of different chemical substances, sometimes very toxic ones, enter the human body with food, water and air. The major migration of people from one region to another has had its impact as well. People traveled to the giant construction projects from all corners of the country, including from regions where the incidence of tuberculosis is traditionally high. Thousands of people lived in barracks and dormitories, often next to carriers of the disease.

It is usually degenerate, socially deformed people that are subjected to tuberculosis: Over half of the tuberculosis patients in the country are alcoholics, hobos [bomzhi] and bums [bomzy]. The life they lead and the lack of treatment create a situation where the disease progresses quickly among such people. After all, one such patient infects up to a hundred healthy people in a year. Throughout the country, there are tens of thousands of people living a nomadic life, without permanent employment and place of residence.

I was acquainted with the following alarming statistic at the Scientific Research Institute of Tuberculosis. Every fifth new identified tuberculosis patient—and with a neglected and infectious form of the disease at that—is, as a rule, an ex-convict. High morbidity among workers in the construction, timber and wood processing, chemical, motor vehicle, and oil and gas industries has persisted for many years now. This stems primarily from the poor working and living conditions of the people. For example, one out of every thousand workers in the timber sector in Perm Oblast is stricken with tuberculosis. There are a third more patients among the rural population than among the urban population, and disability caused by this disease is higher by a factor of 2.2 (this is especially typical of residents of the Far North, Siberia, the Far East and the Northern Caucasus). This is no accident: Tuberculosis is often transmitted to people from sick animals. And in the RSFSR alone, the number of farms troubled in this respect has increased by almost 25 percent in recent years. Need we be amazed that, for

example, among every thousand stock breeders of the Volgograd and Tyumen oblasts, two to three persons suffer from the active form of tuberculosis?

In a word, the situation is very alarming. It is all the more alarming that a third of the tuberculosis hospitals in the RSFSR are housed in old, dilapidated buildings, and they do not have enough beds, that therapeutic and diagnostic equipment is obsolete and has long been worn out, and that the situation with medical personnel is very poor—almost half of the tuberculosis specialists are people at retirement age.

Modern phthisiology is traditionally one of the most organized areas of medicine. But even it is experiencing considerable difficulties today in the face of pressure from circumstances we're all well aware of. Both practical and scientific difficulties. For example, if much is clear to scientists and practical workers about pulmonary tuberculosis, by no means, unfortunately, is everything is clear yet about its other forms (bone, urological, ocular, dermal, gynecological, lymph node, etc.). New factors have drastically reduced the effectiveness of traditional antituberculosis measures. With an unbalanced diet and a living environment of poorer quality, the human body weakens, its immune defenses decline, and, understandably, Koch's bacillus becomes more aggressive, considerably altering the clinical pattern of disease. "Today's" tuberculosis is more severe and proceeds more rapidly, and it is accompanied by serious concurrent diseases.

All of this understandably requires large sums of money. Almost a quarter of a billion rubles were spent just on fluorography for 110 million people in the Russian Federation. And although the expenditures are enormous, they will, nonetheless, more than pay for themselves—after all, it now costs 5,000 rubles to treat a single patient, while it costs half that to identify him from among many thousands of individuals examimed (and consequently to make the individuals him safe).

What, in A. Priymak's opinion, should be done first?

First of all, the country needs to establish a dependable "watch" which would ensure not today's 80-percent detectability, but a full 100-percent detectability of this insidious ailment called tuberculosis. Rather than today's "blanket" control, we should introduce "selective" control, based on persistent observation of specific communities of individuals, of so-called risk groups. And this should be done not by abusing fluorography, which is expensive and not totally harmless, but rather by means of the inexpensive and dependable immunodiagnosis that is gathering momentum. It should be done with dynamic treatment both in the hospital (not more than 15-20 days) and in outpatient clinics (not more than 6 months).

Considering all of this, the RSFSR Ministry of Health submitted a number of proposals to the republic's Council of Ministers just two years ago. The Council of Ministers supported the ministry. For example, mandatory fluorography has been introduced for persons arriving for work in new regions. A procedure for rewarding tuberculosis specialists for quality treatment is being developed jointly with the All-Union Council of Trade Unions. Business-like cooperation has been established with medical personnel of the Ministry of Internal Affairs, a special laboratory is now being created to organize the fight against tuberculosis in detention sites, and a number of their institutions are being re-specialized as preventive treatment-and-work dispensaries. And recently the Ftiziopulmonologiya Scientific-Practical Association was established under A. Priymak at the Moscow Scientific Research Institute of Tuberculosis.

Ukraine Strengthens Genetics Research

18402022 Moscow MEDITSINSKAYA GAZETA in Russian 7 Apr 89 p 3

[Article by Ukrainian SSR First Deputy Minister of Health A. Serdyuk: "What Sort of Child Will Be Born? 'Blank Pages' in Medical Genetics"]

[Text] A child was born to a newlywed family. With Downe's syndrome, unfortunately. The misfortune was aggravated by anxiety for the future: Would this really have to happen again with a second child?

Back at the beginning of the century, I. P. Pavlov said: Physicians must know the basics of heredity; by making the truth about the laws of heredity part of our lives, we would be able to relieve mankind of much sorrow and bitterness. The outstanding scientist-physiologist was right—the accomplishments of recent decades in cellular genetics and molecular genetics opened up not only the prospects but also the real possibilities for treating and preventing many severe hereditary diseases, including nervous and mental diseases.

Take for example Downe's syndrome mentioned above. A medical genetics advisory service employing the methods of fine analysis can not only establish the nature of disease but also predict the health of the next child in the family.

The main thing now is to introduce the discoveries of scientists into public health practice as widely as possible. For known reasons, after all, we are 15-20 years behind the world level of development in genetics. There is something else that needs to be considered as well: When we focused all of our attention on the fight against "the diseases of the century"—cardiovascular ailments and malignant tumors—we somehow overlooked the regrettable fact that the spread of genetically dependent diseases has progressed noticeably in recent years due to aggravation of the ecological situation and other causes. In particular, in 1987 twice more children were born with defects in the Ukraine than 2 decades previously (I do not think that this republic is an exception in the country). The same numerical increase is also observed with adolescent girls exhibiting multifactorial pathology—diabetes, rheumatism, neuropathology and so on, and this is only in one decade.

Our republic was one of the first in the country to address the development of medical genetics. Offices of medical genetics appeared in Kharkov, Kiev and Donetsk a little over 20 years ago. The Krivoy Rog Center of Medical Genetics was established in 1975. Organization of five interoblast centers—in Lvov, Kharkov, Krivoy Rog, Simferopol and Donetsk—back in the 1980s was the starting point for creation of the organizational model of this specialized care.

Today more than 30,000 patients undergo consultation in five regional centers and 16 offices of medical genetics each year. But this is not very much if we consider that congenital and hereditary diseases have moved up to second or third place in the structure of child mortality, and that chronic patients suffering from genetic pathology occupy 20 percent of the available beds in children's hospitals, and a third of the beds in hospitals for the adult population.

To be honest, our successes are rather modest. What is keeping us from working with better results?

We are able and obligated to solve many problems through our own efforts. When we studied the state of affairs more deeply, we persuaded ourselves that in certain cases we simply needed to approach the work with greater responsibility, and more competently. Here is a specific example. Galactocemia and fructocemia are often not diagnosed in time. As a result children die in maternity hospitals, or they suffer mental retardation. And yet, it would be sufficient to eliminate milk, fruit, juices and sweets from their diet to ensure their normal development.

Many years ago the Ukrainian SSR Ministry of Health published an order requiring mandatory testing of children for phenylketonurea in their first months of life, and their outpatient and inpatient treatment. Disease is revealed primarily by children's psychoneurologists, but frequently they do this not in the first months of the child's life, but after it reaches an age of 1 year, and sometimes even more, after clear signs of affliction of the nervous system and mental retardation are already evident, and it is too late for treatment. We are now correcting these errors with all decisiveness. We are also helping specialists to surmount the psychological barriers and stereotypes of former years. The mothers of sick children should no longer have to hear a doctor's stock advice: "Take it from me: He will remain the way he was born. It would be better for you to put him in a home for the disabled." We must fight for the health of every child!

An analysis of the state of affairs made it possible to draw up a specific program of action with the goal of raising the effectiveness of specialized care for the public. There are plans to finish organizing the service that has evolved in the republic, and for establishing offices of medical genetics in the general hospitals of all oblast centers and major cities. Interoblast centers will have the responsibility of providing organizational and methodological guidance to them.

Wherever interoblast centers are already functioning we are beginning to create rayon and interrayon offices at a rate of one office for every 300,000 residents. It is, after all, upon the organized work of the primary link that the most important thing depends—encouraging visits by patients needing consultation in medical genetics. The unofficial position of oblast specialist in medical genetics is being introduced; it will be his responsibility to analyze the level of congenital developmental disorders and of perinatal child mortality.

Because it was revealed that physicians are poorly oriented in hereditary pathology and shut themselves off from it in their practical activity, a decision was made to organize higher quality training primarily for pediatricians, and to have them study the nature and laws of heredity. It was with this purpose that a series of courses in medical genetics was introduced at the neonatology department of the Kiev Institute for the Advanced Training of Physicians. Creation of a department of the same profile is in the immediate future. But even this is felt to be not enough. The main thing is that we need to restructure the thinking of physicians, they need to be made aware of the new specialized service. We are counting on specialists in consultation on medical genetics and on interoblast centers in this regard. They have been instructed to take a most active part in teaching pediatricians, neonatologists and obstetrician-gynecologists the important aspects of medical genetics. Ultimately the program calls for creating training-scientific-production associations that include the above-mentioned interoblast centers and medical institute departments.

But there are problems (typical, I think, of other republics as well) which we are not in a position to solve on our own. Science has fallen behind the needs of medical genetics, and this is retarding development of the specialized service. Practicing physicians justly complain of the absence of valid scientific recommendations that could help them improve dispensary treatment of patients with hereditary diseases, and of disarray in scheduling and determining the volume of observations and examinations of patients. In the Ukraine, for example, research in medical genetics has been conducted haphazardly, without any kind of integration, in small subdivisions of 17 institutes belonging to different departments. The research subjects have often been determined by the researchers themselves.

The board of the Ukraine SSR Ministry of Health proposed focusing the effort of scientists on a few basic, priority scientific and practical directions: the epidemiology of congenital and hereditary diseases, their diagnosis and treatment employing the methods of molecular genetics and bioengineering as well as medical bioengineering, the genetics of multifactorial diseases, and the genetic aspects of human reproductive function. All

research is coordinated under the "Medical Genetics" integrated intersector program.

The lead institute—the Lvov Scientific Research Institute of Pediatrics, Obstetrics and Hereditary Pathology—is being expanded. In the near future it will have a fabulous material base. A number of other organizational measures are being implemented as well.

Given the ecological situation that has evolved, including with regard for the accident at the Chernobyl AES, study of the dynamics of the frequency of congenital developmental defects is acquiring important significance not only to the provision of high quality consultation in medical genetics but also to evaluating the dynamics of possible mutation processes occurring in the population. This is why a decision was made to significantly intensify the genetic monitoring efforts. We are thinking about mapping the mutagenic pool of the republic.

The possibilities of the Institute of Medical Genetics of the USSR Academy of Medical Sciences, the advanced training courses of the Central Institute for the Advanced Training of Physicians, the All-Union Scientific Research Center for the Protection of the Health of the Mother and Child and the Belorussian Republic Center for Metabolic Diseases obviously need to be utilized more extensively for adequate training of specialists.

There is one other important issue. We feel it necessary to create registers of families with hereditary pathology in connection with the rather intensive development of molecular methods of prenatal diagnosis of hereditary metabolic defects in the country. The Institute of Medical Genetics, which possesses possibilities for providing the corresponding assistance to such families, should become the initiator in this issue. It is entirely obvious that it would be practically impossible to create properly functioning registers without clear interaction of scientists and medical genetics consultation offices with maternity hospitals, pediatric wards and oblast public health departments.

Let me lay special emphasis on this: The extremely poor availability of modern apparatus in centers for medical genetics and irregular supply of reagents are a general problem. This complicates the conduct of many important research projects. As an example study of the dynamics of the frequency of congenital developmental defects has important significance not only to organizing quality consultation in medical genetics but also to evaluating the dynamics of mutation processes occurring in the population. In this connection we feel it suitable to monitor congenital developmental defects in individual regions of the republic—depending on the extent of the environment's contamination. However, such research and the efforts to reveal and maintain long-term observations of persons suffering hereditary pathology and their relatives require computer support, formation of databanks and establishment of feedback between the computer and the consultative polyclinic in medical genetics. Without this, we cannot achieve high results in our work.

In a word, many problems have accumulated in medical genetics. Their efficient solution will make it possible to eliminate the "blank pages" along the road of development of promising direction of public health.

Disposable Syringe Production Problems

18402026a Moscow MEDITSINSKAYA GAZETA in Russian 30 Apr 89 p 1

[Article by G. Denisova: "Column on the Cause of the Lack of Responsibility"]

[Text] At the recently held CPSU Central Committee Plenum, named among the scandalous examples of mismanagement which compromise perestroyka and do enormous harm—both economic and moral—to all of society was the extremely poor supply of disposable syringes to the health care sector.

A decision to accelerate the development of their production was made at the very end of 1986. Three USSR ministries—the Ministry of Medical and Microbiological Industry, the Ministry of Instrument Making, Automation Equipment, and Control Systems, and the Ministry of the Machine Tool and Tool Building Industry—set out to carry out the crucial order: to produce 1.3 billion syringes by the end of the current Five-Year Plan.

In October 1987, in an article titled "When Will the 'Record' Be Broken?" this newspaper asked those carrying out the order the a question, How is the problem being solved?

Judging from the answers, the attitude was extremely optimistic in the departments. The then-deputy minister of the medical and microbiological industry, A. Sorokin, told us about how plants in Leningrad and Belgorod-Dnestrovskiy were preparing space for new equipment and how the ministry was energetically working out the problems of new construction. "Basically," he stressed, "the plants will be outfitted with domestically produced equipment, although some of it, of course, must be purchased by import." Nor were the machine-tool and tool builders short of promises. The Pressmash Association vowed to deliver automatic rotary conveyor lines that would be more efficient than any the world had ever seen before. The Ministry of Instrument Making, Automation Equipment, and Control Systems is responsible for the production of the needles for syringes. V. Zhukov, head of the former Glavmedinstrument, asserted that 120 million needles will be turned out as early as 1988 and that a whole series of machine tools and automatic machines were in the developmental stage.

After informing the medical community and the public about that, the newspaper routinely returned to the topic a year later. Another deputy minister of the medical and

microbiological industry, M. Sobolev, responded to the questions of the correspondent in the article, "Where is the long-awaited syringe?"

In that interview, the optimism had already diminished somewhat. The promised capacities at the two plants were not yet on line; only the assembly of the equipment—the imported equipment—was finished. There wasn't any domestic equipment: the Ministry of the Machine Tool and Tool Building Industry had not delivered a single machine. Nor have the lines that were to have buried us in the scarce plastics seen the light of day. The specialists came to the conclusion that it is simpler and cheaper to buy equipment abroad, at something like 700 million rubles!

Then, in October of last year, the Ministry of Medical and Microbiological Industry, unable to set up its own production, quickly went abroad again and purchased its syringe components with its own capital. (That is cheaper than buying finished products.) They decided to assemble them themselves. They tried very hard, thought they had anticipated everything, but they forgot about one small detail—the needles.

Thus, a situation has come about in the hospitals, which, as M. S. Gorbachev said at the Central Committee Plenum, is hard to believe. It's true, the production management of the ministry did tell us that about 17 million needles have been sent to hospitals to go with the syringes, plus 12 million completely assembled syringes. It is, of course, too soon to say that the error has been corrected. Although O. Nikitin, general director of the Lenmedpolimer Production Association, received a stern reprimand, the situation with the needles has not improved much. This year, instead of 200 million pieces, the Tyumen plant of the Ministry of Instrument Making, Automation Equipment, and Control Systems promises to produce 100 million, in all. There is no way they can bring the Japanese equipment up to full capacity here. That means that our newspaper will be writing about disposable syringes a good many times more.

Efforts to Improve Medical Services for Women and Children in Uzbek SSR Assessed

18402028a Moscow MEDITSINSKAYA GAZETA in Russian 2 Apr 89 p 2, col 7

[Article by V. Zhuravlev, MEDITSINSKAYA GAZETA correspondent, Tashkent: "To Achieve a Radical Break"; first paragraph is MEDITSINSKAYA GAZETA introduction]

[Text] **The course of the implementation of resolutions regarding improving the medical assistance provided to women and children in the Uzbek SSR was examined at a regional meeting of the board of the USSR Ministry of Health in Tashkent.**

The scandalous facts published a year and a half ago regarding the situation in pediatric health care did not shake up the Uzbekistan public any less than did the cotton business. The indicators of child and maternal mortality and infectious morbidity and the grievous state of the material-and-technical base that were "revealed" at that time shocked them.

At the republic party and economic aktiv held in August 1987 in Tashkent, the traveling board of the USSR Ministry of Health outlined a specific program for surmounting the crisis. What has changed?

First of all, the attitude of the party and Soviet organs toward the needs and problems of the maternity and pediatric care service has changed radically. The first secretaries of the party obkoms and oblast ispolkoms meet frequently with medical personnel and provide them practical assistance in their undertakings. In the context of administrative reform, about a thousand buildings have been released for use and transferred to health care institutions.

In the buildings transferred last year, 13 pediatric hospitals, 3 maternity hospitals, 24 pediatric polyclinics, and 7 prenatal care clinics were opened. Seventy-two million rubles were spent on renovation and outfitting. A recovery hospital for mothers and children was located in what was formerly a special hospital in Namangan. In Fergana, based on a complex of what were formerly administrative buildings, an oblast rehabilitation center called "Mother and Child" is being created. Dozens of such examples could be listed.

The republic's government has increased its allocations for free feeding of young children to 6 million rubles. About 38,000 public health service nurse positions were added for the work being done at paramedic-obstetric centers.

Industrial enterprises, kolkhozes, and sovkhozes are becoming increasingly active in strengthening the material base of pediatric and obstetric institutions. In the Andizhan Oblast, for example, 58 rural outpatient clinics have already been built through the cooperative funding of farms and the agricultural industry. In the Kommunizm Sovkhoz in the Surkhan-Darya Oblast, a 150-bed pediatric hospital and a polyclinic have been built. Obstetric wings were recently opened at the medical units of the Khiva Carpet Combine and the Azot Production Association. Construction of a women's clinic for the workers of the Tashkent Aviation Production Association imeni V. P. Chkalov is being completed.

Pediatric health care is being restructured. A republic pediatric center has been created at the Central Asia Pediatric Institute and is operating successfully. Health improvement for mothers hospitalized with ill children has been organized at all oblast pediatric hospitals. Day hospitals are operating everywhere in polyclinics and in rural outpatient clinics. In the central rayon infectious hospitals, the number of pediatric resuscitation departments has been increased, and the number of intensive care wards has been increased from 36 to 49. Traveling

pediatric resuscitation teams are operating in the Kara-Kalpak ASSR and in the Bukhara and Fergana oblasts. Treatment in the No. 1 Pediatric Polyclinic in Samarkand has been organized with great effectiveness: permanent home care has been set up for children with chronic illnesses.

Last year, according to data from the USSR State Committee on Statistics, the infant mortality rate in Uzbekistan was 7.6 percent lower than that of the year before.

It would seem to be time to draw some optimistic conclusions; however, the situation regarding the maternity and pediatric health care service is still unstable. Over a two-month period this year, pediatric and maternal morbidity and mortality was sharply up. In January, in the maternity department of the Izbaskanskiy Central Rayon Hospital, a group of neonates fell ill because of medical personnel and the negligence of the health care organizers in charge. The low level of skills among medical personnel is the problem of problems in pediatric health care in the republic. A considerable imbalance in the number of pediatricians remains: with a republic average of 14 pediatricians per 10,000 children, the figure is 39 in Tashkent and 9 in the Kara-Kalpak SSR and the Kashka-Darya Oblast.

It is clear that, given this state of affairs, rural children have little access to skilled, specialized care. In addition, the resolution of the board of the USSR Ministry of Health concerning increasing the training of groups of nurses for pediatric treatment-and-prevention institutions is not being carried out. Only a third of the 10,000 specialists graduated for the intermediate health care team were sent to rural units of the maternity and pediatric health care service.

The situation in pediatric health care in Tashkent is alarming. All the pediatric hospitals are overloaded. In addition, of 7.1 million rubles earmarked for the construction of pediatric and maternity institutions for the 12th Five-Year-Plan, only about 4.1 million has been used, and renovation of the buildings that have been transferred is proceeding slowly.

Chazov, Chelyabinskaya Oblast Aktiv on Pollution, Public Health

18402037 Moscow MEDITSINSKAYA GAZETA in Russian 7 Apr 89 p 2

[Article by TASS correspondents L. Perkina and Ye. Tkachenko: "In the Danger Zone: Party and Economic Aktiv Convenes in Chelyabinsk on Health Care Issues"]

[Text] The presence of almost all the elements from the Mendeleyev Periodic Table among the mineral resources of the Urals has always been the pride of this region. But today it is also one of its misfortunes: The air, the soil and the water of many cities are quite polluted by the same elements. This has become the source of occupational diseases among the region's inhabitants, of a rise in infant mortality, of a worsening of the health of mothers, and of a shorter life span. Concern for public health and for the ecology of the environment permeated statements made by the participants of the Chelyabinsk Oblast party and economic aktiv, during which health care problems were discussed. The importance of the problems under discussion not only to the Southern Ural region, but also to the entire country, was noted by USSR Health Minister Ye. I. Chazov, who traveled here for the meeting.

"How can we talk about a healthy way of life if the concentration of toxic elements in the air of Chelyabinsk, Magnitogorsk and Karabash exceeds the maximum permissible levels several times over?" the minister said. "And only half of the clearly insufficient funds earmarked for construction of nature-conservation facilities are being put to use here. Untreated sewage is being dumped in the oblast's water basins. Most dairies do not meet the required sanitary norms."

The development of the material and technical base of health care also requires more attention. In as large a center as Chelyabinsk, only five or six polyclinics are handling today's needs. And rural health care is generally in a sorry state. For the moment there is nothing that the doctors can do to help. There is simply nowhere for them to go outside the city: nowhere to live, nowhere to work, even though the needs of rural laborers in terms of medical care are great.

"It may be said, of course, that perestroyka is proceeding slowly in health care because of the ministry's apparatus," noted Ye. I. Chazov. "To some extent, that is so; but still, little is being done locally. Can the oblast's largest enterprises really not find the resources and possibilities for repairing the emergency hospitals in Chelyabinsk? It is hard to believe that they can't. Local soviets and labor collectives are being granted ever-greater rights, and now they will be able to change the nutrition standards for patients and earmark funds for repair and renovation of treatment facilities. A specific program for the development of health care must be drawn up in the oblast, and the progress of its implementation must be reported regularly and extensively to the public."

The incidence of cancer is higher in the oblast than in the republic and in the country. Malignant diseases are no longer just a medical problem, they are also a social problem, and the two must be solved together. Many of the participants of the meeting discussed the need for combining the efforts of enterprises and departments and of party and soviet organs to improve the health of the people. They also made suggestions to the minister that, in their opinion, would accelerate the sector's perestroyka.

Ye. I. Chazov visited the oblast and city clinical hospitals, the children's hospital and the maternity hospital of the Chelyabinsk Metallurgical Combine, and the emergency hospital; he met with the oblast's medical workers and answered their numerous questions.

Ye. I. Chazov was accompanied by the first secretary of the Chelyabinsk oblast CPSU committee, N. D. Shvyrev, and the oblast executive committee chairman, B. M. Isayev.

Chemical Contamination of Food in Krasnodarskiy Kray

18402038 Moscow MEDITSINSKAYA GAZETA in Russian 16 Apr 89 p 1

[Article by F. Garkusha, director of the toxicological department of the Krasnodar Kray Sanitary-Epidemiological Station, under the rubric "Putting a Question Point-Blank": "What Are We Eating?"]

[Text] Looking over the rainbow assortment of the produce markets, one unwittingly recalls the advice of the great Avicenna: "Watch your mouth—it's through that that we stuff disease into ourselves."

Is our food really always good for our health? And is it really possible to grow ecologically clean produce, given the preponderance of chemicals? To the sanitary service of Krasnodar Kray, which produces a large quantity of agricultural products, this is an extremely urgent problem. Unfortunately, there is neither unanimity nor meaningful action in terms of its solution among the various services and departments.

Seeds, for example, are treated with highly toxic preparations. One such dangerous ingredient is tigam-Ts.

There have been several cases in which individuals were poisoned by this chemical. But the RSFSR Ministry of Grain Products and the Agroprom went ahead and published instructions on the use of tigam-Ts seed treatment agent and agreed to them at all stages.

It is true that these instructions impose rigid requirements on the material-and-technical base and the equipment of facilities at which this treatment agent is used. But we do not have such facilities. Our combines, elevators and plants were built dozens of years ago. They do not have special equipment, and there are not enough filters to clean the air that is discharged into the atmosphere, or even enough of the air cleaning systems themselves.

Despite the existence of these agreed-upon instructions, the kray's sanitary service banned the use of this highly toxic seed treater.

We often hear that sanitary norms are lower abroad, and that in our country they are supposedly too strict. It is true that standards are lower there, but at least they are always enforced. And if a violator is ever identified, he is punished strictly. But in our country the reverse is true—the requirements are high, but they are meaningless.

The maximum permissible concentrations, maximum permissible levels and other standards now in effect in the country are insubstantial, scientifically groundless, and out of touch with reality. Take, for example, just the nitrates. The norms for their concentration in foodstuffs do not take into account the biological properties of each vegetable or its ability to assimilate nitrates from soil. Moreover, different standards approved by republic ministries of health have been established in different territories. We also have union standards, which differ from republic standards as well. For example, the norms approved by the RSFSR Ministry of Health allow a nitrate concentration in potatoes of 160 mg per kilogram, and for late varieties, 80 mg per kilogram. The union standards allow 200 mg per kilogram. Different standards for the concentration of nitrates in potatoes are in effect in the Ukraine and in Belorussia. The situation is similar with other vegetables. This forces the sanitary service and the marketing organizations into an impasse. Why is there such disarray?

Siberian Public Health Discussed

18402042 Moscow MEDITSINSKAYA GAZETA in Russian 14 Apr 89 p 3

[Article by correspondent G. Balakin and special correspondent A. Gatilov, under the rubric "28th Session of the General Assembly of the Siberian Department of the USSR Academy of Medical Sciences": "To Move Slowly Is to Not Solve the Problem"; first two paragraphs are introduction in source]

[Text] **Considerable criticism has recently been heaped upon the health care sector. Mortality in our country is high, and both the morbidity rate and the quality of treatment leave something to be desired. All of this is so. But these problems are especially acute in Siberia, where industrial production is growing at a rate exceeding the national average. In the meantime, development of the social sphere—and of public health in particular—has fallen noticeably behind here.**

Alas, Siberians no longer measure up to the legends of the past. The people no longer shine with their former health. What medical scientists are doing to improve the health of the population was the topic of discussion at the session of the General Assembly of the Siberian Department of the USSR Academy of Medical Sciences.

During the session, which lasted two days, we were able to interview many people. A meeting with S. N. Potapova, deputy chief physician of Children's Clinical Hospital No 2 in Novosibirsk, is memorable.

"I've worked in this city for more than ten years," said Stanislava Nikolayevna. "But there has never been a situation as complex as the one that exists today. The fact that the hospital and the polyclinic departments are crowded is not even the problem. Things are even worse in other places. But that's a special topic we can talk about another time. What we are troubled by is the fact that 60-70 percent of children are born with pathology. Allergic diseases and neuroses are very widespread. The illnesses of the young patients are chiefly due to the harmful effects of the environment and poor diet. Just go

to the stores in our corner of the country and try to buy fruits and vegetables or the baby food that is so necessary to newborns.

"And ecology? It's enough to say that Novosibirsk enterprises discharge over 400,000 tons of harmful substances into the atmosphere each year. The air is oversaturated by formaldehyde, phenol and its derivatives, and sulfur dioxide. The Ob and other rivers are polluted with pesticides and the salts of heavy metals. The same is also true of the soil. Salts of copper, lead, iron, manganese, nickel and zinc are very readily taken up by plants through their root systems, accumulating in potatoes, cereal crops, vegetables and cattle feed."

According to data from the oblast council of trade unions, 18.3 percent of the workers are heavily exposed to harmful factors. And things are not any better in other Siberian industrial cities. The number of days of peak air pollution is continually growing, which is causing a significant increase in aggravations of chronic diseases of the cardiovascular system and respiratory organs and in allergies. In Novosibirsk Oblast, for example, 3.5 percent of the workers are on sick leave every day. The percentage of days lost for the care of the sick is also great.

Base Year—1920??

Chairman of the Presidium of the Siberian Department of the USSR Academy of Medical Sciences Yu. I. Borodin gave a report on the perestroyka of the activity of the Siberian Department in light of the "Basic Guidelines for Development of Protection of Public Health and Restructuring Health Care in the USSR in the 12th Five-Year Plan and in the Period Up to the Year 2000."

He was followed, one after the other, by three more department directors—chief scientific secretary L. D. Sidorova and two deputy chairmen, Yu. P. Nikitin and V. A. Trufakin. But there is little that is worth reporting. Few of those in attendance could be impressed by the speeches of the respected scientists. Their reports were too divorced from life, from today's very complex problems. They were more reminiscent of yesterday's accountability reports, of times that have faded irreversibly into the past. We did not experience a sense of living, concrete, practical actions or of a genuine restructuring of Siberian science or its orientation on the individual.

USSR Academy of Medical Sciences Academician Yu. P. Nikitin complained that the same demands are being levied upon all scientific research institutes today, be they academy or sector institutes. In his opinion sector scientific research institutes should work mainly on tactical problems—on improving diagnostic, treatment and preventive methods, with due regard for the medical and demographic situation. Academy scientific research institutes should lay more emphasis on strategic problems, conducting basic research and, from that, proposing fundamentally new methods of diagnosis, treatment and prevention that would revolutionize practical medicine. That is, they should spend more time on the medicine of tomorrow.

We feel, however, that given the problems we face today and the poverty of polyclinics and hospitals, which sometimes lack the most elementary equipment and in which patients who wish to be seen by a doctor are compelled to wait their turn for weeks, we cannot do without the help of academy science today. We must of course work for the future. But we cannot forget about the patients who need attention and concern right now. Luckily, many scientists are now working precisely with this viewpoint.

"I think that all fundamental issues of the highest level can and must be resolved in the clinics while simultaneously providing care for patients," says USSR People's Deputy Ye. N. Meshalkin, an academician of the USSR Academy of Medical Sciences and director of the Novosibirsk Institute of Circulation Pathology. "Our collective and the academy institutes of Tomsk are working on the basis of this principle."

And here is what RSFSR Minister of Health A. I. Potapov told us during a break:

"The successes of science are measured chiefly by specific things. In our field, they are measured by the contribution of scientists to protection of public health. And I think it would be wrong to divide spheres of influence between academy and sector scientific research institutes. We support the desire of the Siberian Department of the USSR Academy of Medical Sciences to conduct in-depth, basic research. But when such a desire continues to exist in words only, we cannot offer our support. Unfortunately, there is reason to believe that this is how things are. To our great distress, unfortunately, the Siberian Department's institutions have not yet transferred their discoveries or what they have identified in terms of the general features, biological relationships, and previously unknown structural features of biological tissues, etc., etc., to the Ministry of Health as a basis for subsequent applied research.

"How can we say that basic research is having results if they are not implemented anywhere, and they do not reveal themselves in anything? The seed of doubt is planted, and we wonder if they even exist at all?

"Restructuring is also proceeding too slowly in health care because the numerous programs that exist on paper have not become a real means of coordination and control of science. As a rule, they are simply a record of what is being done within a given scientific area. And we can say without any exaggeration that all of these developments could have proceeded just as well in the absence of any programs. Many programs are but fig leaves that conceal the lack of coordination in the actions of scientific collectives."

The Motor Ship "Kardiolog"

A report by USSR Academy of Medical Sciences Academician R. S. Karpov, chairman of the Tomsk Scientific Center of the USSR Academy of Sciences, evoked the greatest interest in the session. His words gave visible

expression to the specific actions taken by Tomsk primarily in behalf of the individual. For example, last year the center's clinics provided care to almost 10,000 severely ill patients, and over 120,000 patients were treated in outpatient clinics and polyclinics. A total of 1,221 scans were taken with a computer-aided tomograph.

And as had already been reported by MEDITSINSKAYA GAZETA, Tomsk's scientists have deployed a mobile, automated cardiological dispensary aboard the motorized vessel "Kardiolog." This well-equipped consultation-and-diagnostic center has provided residents of remote regions with specialized medical care. Many thousands of patients from remote rural areas have undergone clinical examination and treatment and have been seen by highly skilled specialists aboard the ship.

Innovations have been developed in the Institute of Oncology. They include a unique method for the therapeutic treatment of malignant tumors by fast neutrons, plus an automated screening system that enables early detection of cancers of the lungs and stomach.

In general, Siberian scientists are working on many interesting projects. Participants of the session acquainted themselves with some of them in the exhibition titled "Science for Health Care." But the question is this: How quickly and extensively will progressive experience, promising procedures and precision diagnostic apparatus be implemented?

Once More on Ecology

This discussion was conducted by USSR Academy of Medical Sciences academicians N. V. Vasilyev and M. T. Lutsenko, by Chairman of the Eastern Siberian Affiliate of the Siberian Department of the USSR Academy of Medical Sciences S. I. Kolesnikov, and others. The return to this topic in the last session of the USSR Academy of Medical Sciences is understandable. The unprecedented pointedness with which ecological problems were posed during the election campaign indicates that the society is called for them to be solved as quickly as possible. Today, the poor condition of the environment and its effect upon health no longer need any substantiation. Who, if not the medical specialists, should stand in the vanguard of the ecology movement? A proposal was made at the session to create an Institute of Medical Ecology in the Siberian Department.

This is something worth doing. Let's just hope that we do not forget it as we pursue, as some comrades in the Siberian Department say, certain efforts to restructure, activate and improve.

First Steps in Creating Emergency Medical Aid Service

18400576a Moscow PRAVITELSTVENNYY VESTNIK in Russian No 1, Jan 89 p 5

[Article by Ye. I. Chazov, USSR minister of health]

[Excerpt] Lately, the USSR Ministry of Health has been carefully working out paths for organizing a special medical service for extreme situations in our country. It appears expedient to create three centers of such a service—in Moscow, a city of Central Asia, and a city of Siberia.

We plan to organize a central station for emergency aid in extreme situations at the Institute of Surgery imeni Vishnevskiy, which specializes in treating wounds and wound infections. It is proposed to enlist the services of specialists from other therapeutic institutions, of course.

Needed transport equipment—adverse-terrain vehicles, air-cushion craft, and mobile operating rooms and laboratories—will be concentrated at all of the centers that are created. The centers must also have the opportunity to use airplanes and helicopters for delivering medical teams and evacuating the wounded. A stock of artificial kidneys, blood transfusion systems and various items of medical equipment will be created. These items will include mobile X-ray apparatus, surgical instruments, medicinal preparations, disposable syringes, and blood substitutes. It is also important to have communications equipment which will enable medical groups to exchange information quickly and effectively.

Medical teams which will be able to leave quickly for the place of a disaster in order to render highly qualified assistance are being formed in therapeutic institutions of cities where emergency medical centers will be located. Medical personnel belonging to these teams will continually acquire experience at leading clinics, which will ensure high readiness of these groups.

The medical centers for emergency assistance which we propose to create will become part of a unified state system which will ensure prompt preparations for operations in extreme conditions.

FTD/SNAP

UDC -16.1-084.3-039.57

Dispensary Observation of Cardiovascular Disease Patients in Therapeutic Departments

18400424a Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 88 (manuscript received 15 Dec 87) pp 12-15

[Article by L. S. Serova, V. F. Chavpetsov and L. P. Palshina, Leningrad Scientific Research Institute of Cardiology, RSFSR Ministry of Health]

[Abstract] Cardiovascular disease (CVD) is the leading pathology in the country; about 20-25 percent of the population show various forms of CVD. The goal of this work was to evaluate the quality of medical service received by the CVD patients on therapeutic wards and to develop measures for a more effective control of CVD. Primary medical records from 45 therapeutic departments and three polyclinics in Leningrad were

used in the study. Analysis of the data showed that not all CVD patients were under observation by the dispensaries. Among the dispensary patients, 61.2 percent were CVD cases (primarily ischemias and hypertension); about 64.6 percent were patients over 60 years old, only 5.9 percent were under 40 years of age. Only about a third of the CVD patients received timely treatment; 18.9 percent began therapy as late as 5 years after the onset of symptoms. Too few patients were seen by specialists (only 5.9 percent CVD patients were examined by a cardiologist), and the clinical laboratory studies were suboptimal. Only 20.7 percent were found to have received satisfactory therapy; 70.5 percent needed additional corrective procedures; 4.8 percent received totally inappropriate therapy; and 4 percent were not treated at all. It was concluded that cardiologists should become more active in taking proper care of the CVD patients. References: 8 (Russian).

UDC 314(470.43-22)

Some Socio-Demographic Aspects of Rural Population Aging

18400424b Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 88 (manuscript received 17 Feb 87) pp 15-19

[Article by I. A. Gekht, Volga Central Rayon Hospital of Kuybyshev Oblast]

[Abstract] Lower birth rates and continued migration of young people from the villages to cities are responsible for ever increasing average age of the rural population. In the Volga region of Kuybyshev Oblast, the percentage of those over 60 years of age was 11.8 percent in 1970, 13.8 percent in 1979, and 16.2 percent in 1983. A total of 6.4 percent and 19.2 percent of men in the age brackets 60-69 and over 70, respectively, lived alone; 60.1 percent and 80.8 percent of women in those age brackets lived alone. This probably reflects the fact that men of such age who live alone join their children or other relatives, as they are less capable of taking care of themselves than are women. A definite seasonal migration trend exists. Most of the single individuals are widows (90.1 percent) or widowers (86.5 percent). Many are quite active, capable of taking care of their needs. A total of 78.8 percent of men and 45.4 percent of women continue working after reaching the retirement age, many in order to continue to have a solid financial base. The primary reason for not continuing to work was poor health. Some 65 percent of the seniors polled have TVs; 73.8 percent, refrigerators; and 76 percent subscribe to newspapers and journals.

UDC 312.1(470)

Dynamics of Indices for Rate of Out-of-Wedlock Births in Perm

18400424c Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 11, Nov 88 (manuscript received 29 Nov 87) pp 19-23

[Article by Ye. Ya. Titova and L. Ya. Oberg, Department of Social Hygiene and Organization of Public Health, Perm Medical Institute]

[Abstract] Recent statistics point to increased divorce rates, increased rates for out-of-wedlock births and more single-parent families. Between 1970 and 1978, out-of-wedlock births doubled in the Russian Federation, so that one in every 8-9 children is now born out of wedlock. In 1981, more than half of all first-time pregnancies in Perm were initiated out of wedlock. The authors studied the out-of-wedlock birth rate in Perm for the period of 1970-1985. During that period, the births to unmarried mothers rose to 16.5 percent from 12.6 percent of the total births. This rate was quite uniform for all age groups of the mothers studied (average age of these mothers ranged from 24.75 to 26.53 during the 15 years of study). The out-of-wedlock birth rate is being studied as an acute demographic socio-hygienic and medical problem with serious effects on the reproduction patterns and on public health in general. References: 11 (Russian).

UDC 616.12-084+[378.661]+616.12-082

Organization and Initial Results of the Work of an Academic-Research-Clinical Association (Combining a Scientific Research Institute, VUZ, and Hospital) on Preventive Cardiology Problems

18400487 Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 61 No 1, Jan 89 (manuscript received 9 Oct 87), pp 55-57

[Article by A. N. Britov, A. K. Merzon, R. G. Oganov, V. N. Sofin, V. V. Kolomiyets, V. D. Gromenkov, All-Union Scientific Research Center of Preventive Medicine, USSR Ministry of Health; Department of Internal Medicine No. 3, Donetsk Medical Institute; City Hospital No. 3, Donetsk]

[Abstract] The decrees of the party and Council of Ministers on restructuring of education emphasize the need to create scientific-educational-production complexes (associations) to improve the practical training of future specialists. Especially sharply felt is the shortage of specialists in the field of preventive medicine. This article discusses the operation of an association that consists of the health ministry's Scientific Center for Preventive Medicine, the department of internal medicine No. 3 of the Donetsk Medical Institute, and the Donetsk City Hospital No. 3. Based on years of cooperation among these institutes, the association was created by a trilateral five-year agreement among the parties in September 1986. The center develops basic approaches to the prevention of hypertension in the population, improves and approve procedures for preventive cardiology, provides periodic training seminars for personnel from the other two institutions, and invites their participation in conferences, symposia, etc. The internal medicine department, among other things, develops specific programs of operation and trains interns in the procedures and techniques associated with actively preventing hypertension in populations affiliated with institutions and populations that are unaffiliated. The hospital ensures the implementation of a secondary hypertension

prevention program in those populations. An anonymous questionnaire indicated that over 94% of persons involved in the association evaluated its work positively after a year of operation. The results of the first year of operation of the association confirmed the usefulness of such associations and the expediency of their organization throughout the country.

Steps To Improve Burn Treatment Services' Mobility, Equipment

18400576g Moscow PRAVDA in Russian 23 Jun 89 p 3

[Article by Nikolay Gogol and Igor Mosin, correspondents]

[Abstract] In a lengthy article, the status of facilities for emergency and long-term care of burn patients is assessed in the aftermath of the recent disaster involving trains on the Ufa-Chelyabinsk railroad. It is mentioned that about 150 persons who were injured in this accident were still receiving treatment for burns at Moscow facilities 2 weeks after the incident.

The country's approximately 100 departments which specialize in burn therapy reportedly have encountered problems with obtaining medications and modern equipment. There is an acute shortage of special beds which the "Klinitron" firm produces, for example. These beds are equipped with air cushions which reduce pain. Bed sheets, catheters, intubation tubes, artificial kidneys, and equipment for artificial ventilation of the lungs are among the other items which Soviet industry is not supplying in sufficient amounts. For shortages to be offset, equipment and medications have to be acquired abroad or through international organizations.

Igor Nikolayevich Denisov, USSR first deputy minister of health, mentioned some of the problems which paucity of modern burn-treatment facilities has created. Whereas no more than four burn patients at a time are treated in each specialized ward in Western countries, the number of patients per ward in the Soviet Union is 6 to 12, for example. V. Sologub, head of the All-Union Burn Center, stressed the need for a special service to render on-the-spot assistance to victims of accidents as quickly as possible, using specially equipped aircraft. He noted that airplanes and helicopters currently in use are intended chiefly for transporting accident victims to hospitals and do not carry special equipment for in-flight care of patients; moreover, patients cannot be landed directly at hospitals. Ambulance helicopters with modern equipment were demonstrated recently by specialists of the Ministry of the Aviation Industry, it is recalled, but supplying of such aircraft still has not been organized.

In response to this situation, the USSR Ministry of Health has prepared and submitted to the USSR Council of Ministers documents regarding the creation of a medical service for major accidents, natural disasters and other extreme situations, Denisov reported. This fast-response service would be equipped with the most modern technology, and its "nerve center" would be located at the USSR Academy of Medical Sciences' Institute of Surgery imeni Vishnevskiy. Four or five territorial centers of this type would also be created. From these centers, physicians could reach the place of any disaster within 2 hours. Denisov was hopeful that enlistment of defense industry in production of items for health care would solve the medical-equipment problem within the next 2 years. Creation of joint enterprises also is envisaged. A plant which is under construction near Syzran will produce about 200 types of medical products, for example. The authors of the article suggest that enterprises may need stronger economic incentives for production of medical equipment and that cooperation with foreign specialists may have to be expanded if the country's burn-treatment capabilities are to improve.

FTD/SNAP

Analysis of Psychological Sequelae of Computerization of Psychodiagnostic Activities

18400419a Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 10 No 2, Mar-Apr 89 pp 33-45

[Article by O.K. Tikhomirov and L.P. Guryeva, Moscow State University imeni M.V. Lomonosov]

[Abstract] The introduction of computers into the practice of psychodiagnosis encompasses both positive and negative elements, all of them with psychological sequelae that may be difficult to assess over the short and long run. Basically, computerization represents a marked departure from traditional psychodiagnosis and cannot be regarded as a simple step leading to greater efficiency, but must be seen in terms of altering values, motivations, goals, and operational parameters. It is clear, however, that a full appreciation of the effects of computers entails an assessment of the personality characteristics of the diagnosticians and the clients vis-a-vis this form of automation of the psychodiagnostic process. The review ends with a brief summary of determinants that may or may not be modified to render computerized psychodiagnosis more user- and client-friendly. At the present state of development certain determinants are immutable, such as the speed of information processing, which may be regarded as a negative phenomenon. Other determinants that lend themselves to ready improvement and correction are represented by, for example, ergonomic factors. Still other determinants dealing with training, legal aspects, administrative matters, and so forth, may require considerable time for resolution but, once resolved, should alleviate many negative effects. References 39: (Russian).

UDC 616-001.28-036.11-058.66(477)"1986"

Diagnosis, Clinical Picture, and Treatment of Acute Radiation Sickness in Those Afflicted During Accident at Chernobyl AES. I. Irradiation Conditions, Dose Levels, Bone-Marrow Syndrome and Its Treatment

18400488c Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 61 No 1, Jan 89 (manuscript submitted 3 July 87) pp 95-103

[Article by A. K. Guskova, A. Ye. Baranov, A. V. Barabanova, A. A. Moiseyev, Ye. K. Pyatkin, G. D. Selidovkin, and N. A. Metlyayeva]

[Text] The reactor accident at the Chernobyl AES on 26 April 1986 resulted in the occurrence of acute radiation sickness in 145 persons.

The goal of the present work is to present basic data about the conditions and doses of external and internal radiation, the clinical and hematological symptoms of bone-marrow syndrome, and methods of treating it in 115 patients with acute radiation sickness who were in a specialized hospital in Moscow (Clinical Hospital No. 6 of the USSR Ministry of Health).

The accident entailed the destruction of a portion of the reactor's core and the building it which it was located. More than 30 fires broke out, and vapors, gases, and aerosols containing radioactive nuclides were released into the atmosphere.

All those factors may have affected people located at the production site at the moment of the explosion and those who came to the site to halt the effects of the accident and extinguish the fire the first minutes and hours after the accident (there were about 500 persons in all).

The dose strengths of γ- and β-radiation and their dynamics in individual sections where people were located the first minutes and hours after the accident are unknown. The general patterns are such that the dose strength of γ-radiation drops relatively quickly because of the decay of some of the radionuclides. There are no data from individual dosimetry.

The medical and sanitary section servicing the AES obtained information about the accident at the plant within 10-15 minutes. First aid was provided to victims at the plant's health center by medical personnel and first aid teams beginning from 30-40 minutes after the accident for about 3-4 hours. The first aid consisted of removing victims from the production site, providing very simple sanitary treatment, administering antiemetic and symptomatic (sedative, cardiac) agents, and transporting individuals with a pronounced primary reaction to the medical and sanitary section. Individuals who felt alright were actively called in the medical and sanitary section for examination within the first 12-24 hours after the accident. In all, 132 persons were hospitalized in the medical and sanitary section within the first 12 hours. One individual who sustained acute thermal burns died within the first 5 hours, and one of the reactor personnel was not found. His workstation was located in the zone of the collapse and high activity.

Twelve hours after the accident a specialized accident team arrived and began work. Over a 36-hour period, the brigade and workers from the medical and sanitary section examined more than 350 persons and performed about 1,000 blood analyses (2 to 3 analyses for each person examined). Potassium iodide therapy was begun.

In the first three days, 299 persons suspected of having acute radiation sickness were sent to a specialized hospital in Moscow and to hospitals in Kiev. Approximately 200 more persons were subsequently sent for examinations.

The main criteria for establishing a diagnosis and determining hospitalization priorities were as follows: the presence, time of onset, and intensity of nausea and vomiting; primary erythema of the skin and mucous membranes; and a drop in the number of lymphocytes in the peripheral blood below 1 x 10^9/l during the first several days after irradiation.

The diagnosis of acute radiation sickness was subsequently confirmed in 99 of 128 of those seen at the specialized hospital in the first two days (firemen, operators of the no. 4 unit, duty and auxiliary personnel in the turbine room) and in 6 of the 74 victims hospitalized during the next 3 days. This indicates the high specificity of the methods used for primary screening for acute radiation sickness. Yet another 10 cases of mild acute radiation sickness were diagnosed in individuals who were at the production site at the moment of the accident, but who, for a number of reasons, came to the hospital later. No one among the public was found to have acute radiation sickness.

A repeat check for contamination was performed in the receiving room of the specialized hospital, and when necessary, sanitary treatment was provided (showers with ordinary soap and changes of linens). Blood and urine samples were taken for quick assessment of the incorporation of radionuclides, and measurements were taken of the radioactive iodine content in the thyroid (the measurements were repeated another 4-6 times over the course of 6-10 days). Counters based on scintillation and semiconductor detection units were used to measure the whole-body radionuclide activity. Data about the possible effect of neutrons (the absence in the blood samples of chemical element activation products) were not obtained. It was established that the main dose-forming radionuclides were ^{131}I, ^{132}I, ^{134}Cs, and ^{137}Cs (iodine, 10-150 μCi, and cesium, 30-200 μCi). Traces of ^{95}Nb, ^{144}Ce, ^{103}Ru, and ^{106}Ru were also found.

In conjunction with an analysis of information about the accident conditions and the presence of clear symptoms of a primary reaction (nausea, vomiting, diarrhea, hyperemia of the mucous membranes and skin, lymphopenia) in a considerable number of those injured, these data

confirmed that the main factors in the effect were as follows: (1) external, relatively uniform γ- and β-radiation; (2) application of β- and γ-active nuclides onto the skin; and (3) entry of those nuclides into the body in quantities incapable of causing acute radiation sickness.

Exposure to all of those radiation factors in combination was detected in only two patients with widespread steam burns. They were found to exhibit a more substantial entry of radioactive iodine (about 12-30 μCi) and cesium (about 4-10 μCi) into their bodies through their injured skin.

Thus, in the first days, one of the main diagnostic tasks was to assess the degree of severity of the bone-marrow syndrome based on the dose of external total γ-irradiation. This was possible exclusively on the basis of previously developed methods,[1-3] i.e., based on the number of lymphocytes and chromosome aberrations in a culture of peripheral blood lymphocytes or based on the number of aberrations in bone marrow preparations.

Dependencies of the dose-effect type were obtained for the specified indicators in an analysis of cases of relatively uniform accidental or therapeutic irradiation of people with a precisely established dose and normal initial hematologic indicators.[4] Figures 1 and 2 present curves and analytical expressions of the number of lymphocytes as a function of the dose on each of the first 9 days or the average number of lymphocytes from day 4 to day 7 after irradiation. To calculate the dose based on chromosome aberrations in a lymphocyte culture, we used a dose-effect curve for the number of dicentrics (the most precisely calculated aberrations) in 100 cells of the first mitosis obtained during whole-body γ-therapeutic irradiation (in a dose of 1-5 Gy) of patients with acute leukosis in a period of complete clinical and hematologic remission to consolidate it.[5]

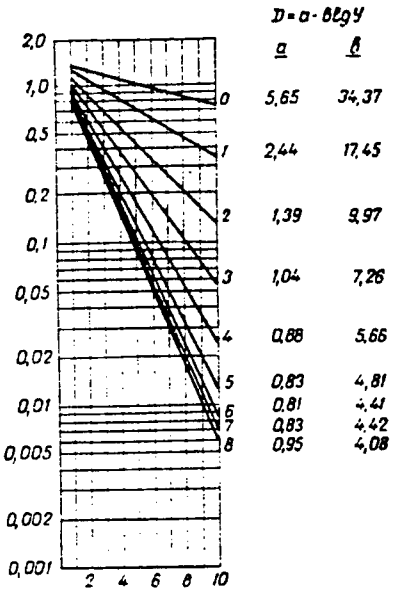

Figure 1. Graphs and analytical dependencies for assessing the average dose of total intermittent, relatively uniform -irradiation of a person based on the number of peripheral blood lymphocytes on each of the first 9 days after irradiation. (Here and in figures 2 and 5, the dose of γ-irradiation D is indicated along the *x* axis (in Gy), and a and b are coefficients. The *y* axis on the left here and in Figure 2 indicates the number of lymphocytes (*Y*) x 10^9/l. On the right and in Figure 5, it indicates the time after irradiation (in days).

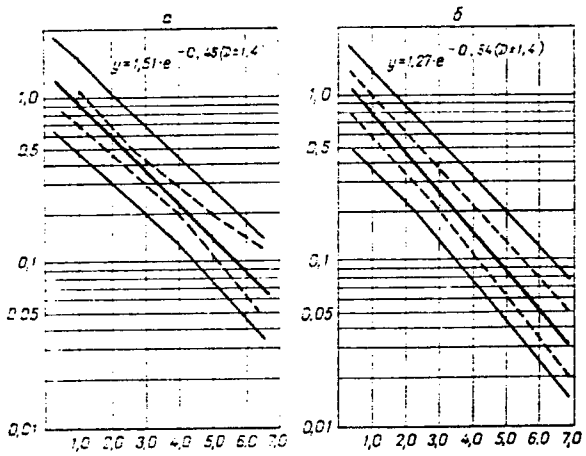

Figure 2. Graphs (heavy lines) and analytical dependencies for estimating the average dose of γ-irradiation in an individual: on the left, based on the average number of lymphocytes from day 4 to day 7 inclusively; on the right, based on the minimum number of lymphocytes from day 1 to day 8. (The thin, solid lines demarcate the regression zone for individual values of the number of lymphocytes, and the dashed lines demarcate the zones for the average values of the number of lymphocytes with a level of confidence of 95 percent.)

The mathematical formula has the following form:

$$D = \frac{-a + \sqrt{a^2 + 4by}}{2b}$$

and it is based on a linear-quadratic dependence of the type $Y = (a +/- 2.24)\cdot D + (b +/- 0.56)\cdot D^2$, where D is the γ-radiation dose at the center of the body (in Gy), y is the number of dicentrics per 100 cells, $a = 8.36$, and $b = 5.70$.

Until day 7 after the accident the doses of total γ-irradiation were refined primarily on the basis of the number of peripheral blood lymphocytes and, more rarely, in the most severe cases, on the basis of the number of chromosome aberrations. Doses of total γ-irradiation estimated on the basis of the number of dicentrics are presented later in this article. That made it possible to separate the victims into a number of groups based on the predicted severity of their bone-marrow syndrome—mild (1.0-2.0 Gy), average (2.0-4.0 Gy),

severe (4.0-6.0 Gy), and extremely severe (6 Gy or more)—and to identify those individuals whose irradiation dose was less than 1.0 Gy.

In the first several days, special attention was paid to identifying individuals with extremely severe (irreversible) myelodepression, which required emergency bone-marrow transplantation.

The following were the additional criteria used to make a more accurate determination of who belonged in this group: onset of vomiting in the first half-hour and diarrhea in the first 1-2 hours after the beginning of the irradiation, enlargement of the parotid glands in the first 24-36 hours, and the conclusion that the degree of myelodepression was irreversible; the conclusion was reached by using a previously developed diagnostic table (see the table included).

Table 1.
Identification of Irreversible Myelodepression on the Basis of Diagnostic Coefficients in Acute Radiation Sickness

Symptom	Diagnostic Coefficient	Symptom	Diagnostic Coefficient
Time until onset of vomiting, in hours:			
		No. lymphocytes from day 4 through day 7 x 10^9/l:	
0.00-0.4	+8	0.00-0.1	+5
0.41-0.8	+4	0.11-0.2	+2
0.81-1.2	+2	0.21-0.3	-1
1.21-1.6	-2	0.31-0.4	-5
1.61-2.0	-6	0.41-0.5	-13
>2.0	-10	>0.5	-15
No. lymphocytes on day 2 x 10^9/l:			
		Average no. reticulocytes from day 3 through day 5 x 10^9/l:	
0.00-0.2	+6	0.0-8.0	+2
0.21-0.4	+2	8.1-10.0	0
0.41-0.6	-2	10.1-14.0	-4
0.61-0.8	-8	14.1-18.0	-6
>0.8	-15	>18	-10
No. lymphocytes on day 3 x 10^9/l:			
		Minimum no. neutrophils on days 6-7 x 10^9/l:	
0.00-0.1	+8	0.00-0.3	+12
0.11-0.2	+2	0.31-0.6	+5
0.21-0.3	-2	0.61-0.9	0
0.31-0.4	-9	0.91-1.2	-3
>0.4	-10	1.21-2.4	-6
		>2.4	-8
No. lymphocytes on day 4 x 10^9/l:			
0.00-0.1	+4		
0.11-0.2	+2		
0.21-0.3	0		
0.31-0.7	-2		
0.71-1.8	-3		
>0.8	-8		

Note: The diagnostic coefficients must be determined from the symptoms and added together. A total of plus or minus 10 indicates irreversible myelodepression; any number less than 10 indicates the absence of irreversible myelodepression. If after adding the coefficients of all the existing symptoms, no threshold is reached, then the response is undetermined (the existing information is insufficient for differential diagnosis with a probable error of no higher than 10%).

Based on the dose, the complete dynamics of the number of neutrophils and thrombocytes (Figure 3) was predicted by using standard curves that we had derived previously.[4] As an example, Figure 4 presents the actual and predicted neutrophil curves of patient D. The total γ-irradiation doses, which were estimated from the average number of lymphocytes from day 4 through day 7 and from the dicentrics, amounted to 2.4 and 3.3 Gy, respectively. The curve of the patient's neutrophil content virtually coincides with the predicted neutrophil content curve for 3.0 Gy total γ-irradiation.

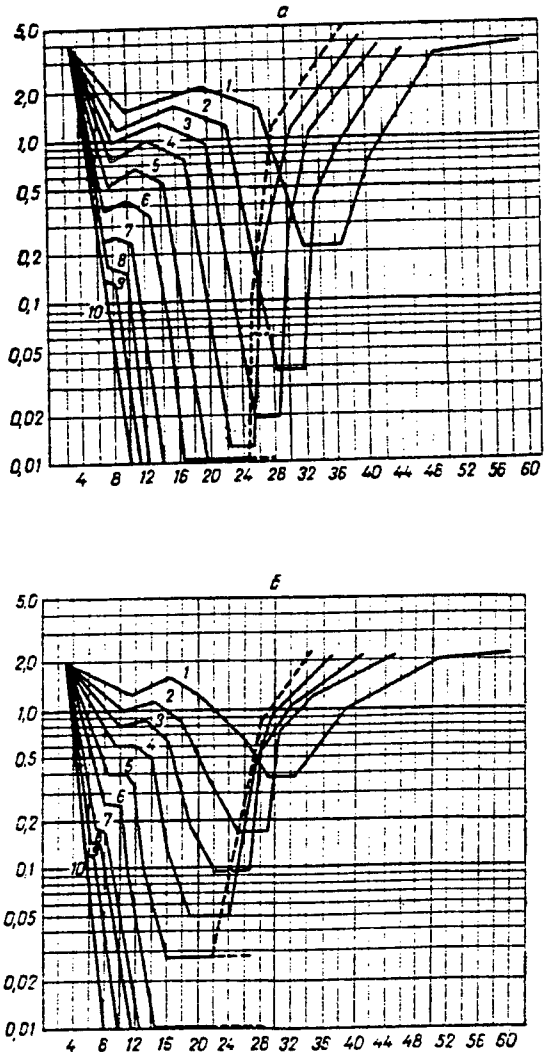

Figure 3. Standard dose curves of the number of neutrophils (left) and thrombocytes (right) in the peripheral blood after total intermittent, relatively uniform -irradiation of the individual. (Here and in figures 4, 6, and 8, the *x* axis indicates the time after irradiation (in days). The *y* axis indicates the following: (left-hand graph) number of neutrophils x 10^9/l; (right-hand graph) number of thrombocytes x 10^{11}/l. The numbers on the curves indicate the average dose of -irradiation (in Gy). A recovery phase, beginning at a dose of 6.0 Gy, is absent. At a dose of 5.0 Gy, it is determined without reliability (dashed lines).

Standard neutrophil dose curves were also used for a final decision regarding the size of the dose of total γ-irradiation—either by determining the dose curve to which the actual curve corresponded in terms of the phase of the second (main) destruction or else by using dose dependencies of such indicators of the second-destruction phase as time required for the number of neutrophils to be reduced to 0.5 x 10^9/l (at irradiation doses not causing a reduction of neutrophils below 0.5 x 10^9/l, the time required to reach the middle of the second-destruction phase was used as a reference point) (Figure 5).

A diagnosis of acute radiation sickness at comparatively low irradiation doses (on the order of 1.0 to 1.5 Gy) was definitively reached only in those cases where standard postirradiation curves of the dynamics of the number of neutrophils and/or thrombocytes—i.e., having distinct second-destruction phases and a minimum recovery level (they usually begin 4-5 weeks after irradiation)—were observed. To detect these types of changes, it was necessary to conduct frequent (no fewer than 2-3 times per week) blood analyses over the course of 1.5-2 months. Figure 6 presents examples of such curves: patient K (represented by the top graph), who received a dose (based respectively on the number of lymphocytes from day 4 to day 7 and dicentrics) of 1.1 and 1.4 Gy, and patient P (represented by the lower graph), whose respective estimated doses were 0.3 Gy (based on the number of lymphocytes on day 9 [only his first blood analysis, because of late arrival]) and 0.9 Gy (based on dicentrics). It should be noted that at low doses the

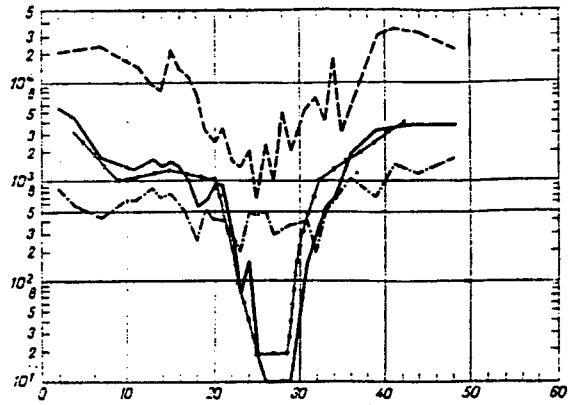

Figure 4. Curves of the number of neutrophils, thrombocytes, and lymphocytes of patient D, who had second-degree acute radiation sickness (a dose of total -irradiation of 3.3 Gy) and the predicted neutrophil curve. (Here and in figures 6 and 8, the *x* axis indicates the number of blood cells: the solid line indicates neutrophils (x 10^6/l); the dashed lines indicate thrombocytes (x 10^7/l); the dotted-and-dashed line indicates lymphocytes (x 10^6/l); and the line with the circles indicates the predicted neutrophil curve for a -irradiation dose of 3.0 Gy.)

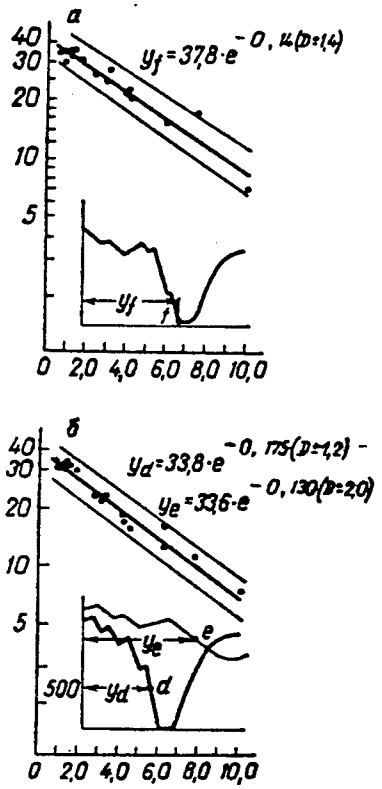

Figure 5. Estimate of the dose of total relatively uniform γ-irradiation of the individual based on dose-effect dependencies for three neutrophil curve indicators: (left-hand graph) time of the beginning of the minimum of the second-destruction phase (point *f*); and (right-hand graph) time of the onset of the "day of 500 neutrophils" (point *d*) or time of the middle of the second-destruction phase (point *e*); the latter is used instead of point *d* if the neutrophil level does not fall to 0.5 x 10^9/l or more. (*Yf, Yd,* and *Ye* are the times from the beginning of the irradiation to the onset of the respective point of the curve (in days), and *D* is the dose of -irradiation in Gy.)

minimum level of the number of neutrophils occurred later (day 30-50) than that of the thrombocytes (day 20-40), with the reduction in the number of thrombocytes and the recovery being more distinct.

Based on all of this data, a diagnosis of acute radiation sickness with first-, second-, third-, and fourth-degree bone-marrow syndrome was finally established in 31, 43, 21, and 20 patients, respectively.

The clinical symptoms of bone-marrow syndrome corresponded to the profoundness and duration of postirradiation pancytopenia (neutrophils, < 0.1-0.5 x 10^9/l; thrombocytes, < 10-20 x 10^9/l). The main symptoms were fever, infectious complications, and petechial hemorrhages on the skin and mucous membranes of the mouth.

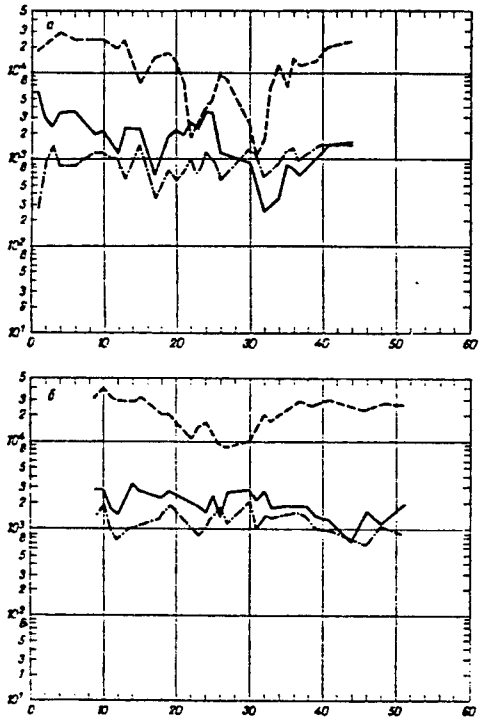

Figure 6. Examples of the dynamics of the number of neutrophils, thrombocytes, and lymphocytes in two patients with first-degree acute radiation sickness (a, patient K: γ-irradiation dose, 1.4 Gy; b, patient P: γ-irradiation dose, 0.9 Gy).

Treatment was based on the principles of maintenance therapy (isolation, decontamination of the intestine, systemic antibiotics, and replacement transfusions of the cellular components of the blood), and in the case of irreversible myelodepression, allogeneic bone marrow transplantation and transplantation of human embryonal liver cells were used.

All patients with second- through fourth-degree bone-marrow syndrome were placed by themselves in ordinary hospital rooms equipped to provide aseptic patient management: sterilization of the air by ultraviolet lamps; strict observance by hospital personnel of hand washing upon entering and leaving the room; mandatory use of individual or disposable gowns, masks, and caps; shoes treated with antiseptics; changing of patients' linens at least once a day; washing of room walls and floors and articles used by patients with antiseptics; and personalizing nursing items that have been treated with antiseptics in the room. The specified regimen ensured a microorganism content in the air of no more than 500 colonies per cubic meter. The food was ordinary fare. Only raw vegetables, fruits, and canned products were excluded.

Endogenic infections were prevented by using biseptol-480 and nystatin, 6 tablets and 5 million units internally daily, respectively, for 1 to 3 weeks until the development of agranulocytosis (leukocytes, 1.0 x 10^9/l, including neutrophils at a level of 0.1-0.5 x 10^9/l).

When fever appeared, two or three broad-spectrum antibiotics were prescribed intravenously—one each from the aminoglycosides (gentamicin or amikacin), cephalosporins (Kefzol, Cefamezine, Cefobid), and semisynthetic penicillins with antipyocyanic activity (carbenicillin, pipracyl)—all at maximum dosages. This cured the fever in no fewer than half the patients. In the absence of an effect within 24-48 hours, γ-globulin (Sandoglobulin) provided by the firm Sandoz (Switzerland) (6 g intravenously three to four times every 12 hours) was widely used.

The tactic of early empirical intravenous injection of amphotericin B in a dose of 1 mg/kg/day was used if the fever was not cured in a week by the aforementioned antibacterial antibiotics in conjunction with intravenously injected γ-globulin.

In the present situation, acyclovir was used for the first time and with good results to treat acute radiation sickness patients infected with the virus herpes simplex, which affected no fewer than one-third of those patients with third- and fourth-degree acute radiation sickness. Acyclovir was not used prophylactically. Experience indicates that this should be done with total irradiation in high doses. Acyclovir-containing salve had a good effect when used to treat herpetic skin lesions.

That regimen of empirical antiinfection therapy turned out to be highly effective. There were virtually no lethal outcomes due to infection in patients with bone-marrow syndrome, even severe and extremely severe forms of acute radiation sickness that were not complicated by burns, radiation enteritis, or acute secondary disease resulting from bone marrow transplantation. In addition, autopsies of those who died from non-bone-marrow injuries did not reveal conclusive macroscopic signs of bacterial or mycotic infections (septiconecrotic foci). Epidermal staphylococci were harvested from the blood of those who died, both while they were alive and after their deaths.

The efficient use of fresh donor thrombocytes to prevent and treat hemorrhagic diathesis was one of the undisputed successes in the treatment of bone-marrow syndrome in this group of patients with acute radiation sickness. A procedure for obtaining thrombocytic mass by the method of quadruple thrombocytopheresis from individual donors at seven centers in Moscow was quickly organized at the direction of the government commission (A. I. Vorobyev, academician of the USSR Academy of Medical Sciences and professor, and I. B. Suchchenko, doctor of medical sciences). Thrombocytes obtained form one donor (on average, 300 x 10^9 thrombocytes in 200-250 ml plasma) were used in the first transfusion. The transfusions were begun when the blood thrombocyte level fell below 20 x 10^9/l, and only upon the appearance of the first symptoms of hemorrhage were the transfusions repeated after 1-3 days. The thrombocytic mass, like all other blood components, must be irradiated at a dose of 15 Gy just before infusion in order to deactivate the immunocompetent donor cells (to prevent acute secondary disease).

This regimen of thrombocyte transfusion not only ensured the absence of life-threatening hemorrhages (even in patients with protracted [more than 2-4 weeks] and intensive thrombocytopenia), but also ensured the absence of any signs of hemorrhagic diathesis in general in the majority of patients.

In the current situation, cryoconserved allogeneic and autologous thrombocytic mass was used successfully. The latter was obtained from patients with second- and third-degree bone-marrow syndrome in the first days after irradiation (1-2 sessions), which was not reflected in the regular postirradiation dynamics of their thrombocyte counts.

There were no cases of refractoriness to transfusion of thromboconcentrate. On average, from three to eight transfusions of the standard quantity of thrombocytes (300 x 10^9 cells) were required to treat one patient with second- or third-degree acute radiation sickness.

No leukocyte mass was used to prevent and treat agranulocytic infections. The need for erythrocyte mass turned out to be considerably higher than anticipated, even in patients with the uncomplicated severe radiation burns of second- and third-degree acute radiation sickness.

Figure 7 presents the clinical picture of patient Z, who reflects the typical amount and duration of replacement and maintenance therapy in the so-called purely bone-marrow form of acute radiation sickness (in this case, there were no clinically significant acute radiation injuries to other tissues).

A team of physicians from the United States headed by R. P. Gale took part in the treatment using allogeneic bone marrow transplantation and transplantation of human embryonal liver cells. Six allogeneic bone marrow transplantations were performed before the beginning of the joint work (which began on 5 May 1986). In matters regarding the indications for and performance of the transplantations, identical principles were observed before and after the beginning of the joint treatment, which on the American side was performed directly by Dr. R. E. Champlin (United States).

A dose of total γ-irradiation (estimated on the basis of the number of peripheral blood lymphocytes and chromosome aberrations) on the order of 6.0 Gy or higher was an indication for allogeneic bone marrow transplantation and transplantation of human embryonal liver cells. According to the thinking at the time, irreversible or extremely protracted intensive myelodepression is predicted at this dose. It was felt that stable survival of the transplantate was impossible given irreversible myelodepression and that therefore the risks of acute secondary disease (and its negative consequences in the case of allogeneic bone marrow transplantation) developing in a patient with an increased estimated dose of

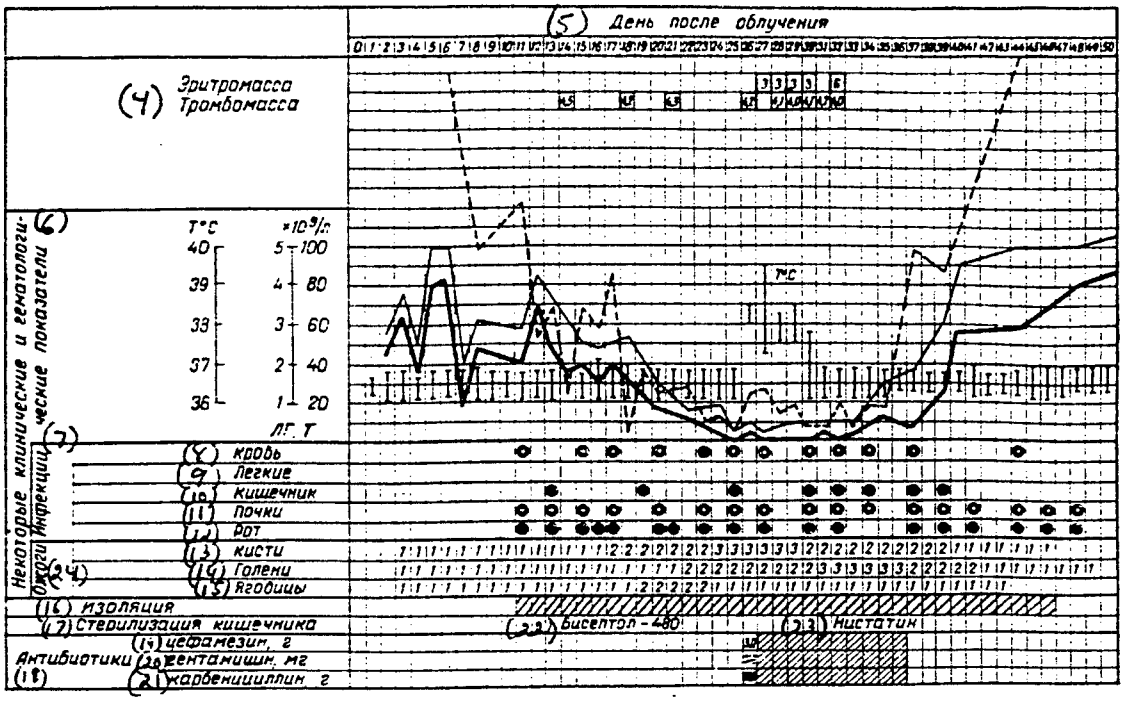

Figure 7. Clinical picture of patient Z with third-degree acute radiation sickness (dose of total -irradiation, 3.9 Gy). Erythromass, x 100 ml; thrombomass, number of transfused thrombocytes x 10^{11}; the vertical lines on the graph indicate the body temperature (the maximum and minimum in the course of a day). The thin solid line indicates leukocytes, the thick line indicates granulocytes, and the dashed line indicates thrombocytes. The small circles in the "infection" section indicate the results of a bacteriologic study of the blood or isolates from the respective organs (sputum, stool, urine, etc.); the open small circles indicate no growth, the black small circles mean that bacteria or fungi were detected. The numbers in the "burns" section indicate the degree of radiation burn: 1, hyperemia, pigmentation, and dry desquamation of the epidermis; 2, moist desquamation; 3, erosions and ulcers.

Key: 4. Erythromass, thrombomass—5. Day after irradiation—6. Some clinical and hematological indicators—7. Infections—8. Blood—9. Lungs—10. Intestine—11. Kidneys—12. Mouth—13. Wrist—14. Knees—15. Buttocks—16. Isolation—17. Sterilization of intestine—18. Antibiotics—19. Cefamezine, g—20. Gentamicin, mg—21. Carbenicillin, g—22. Biseptol—23. Nystatin—24. Burns

total γ-irradiation were insignificant. It was also borne in mind that early temporary survival of the transplantate (even if it is subsequently rejected) may be of some use by reducing the intensity and duration of neutropenia.

Bone marrow from close relatives (brothers and sisters or parents) with identical (6 cases), haploidentical (4 cases), or haploidentical plus one common antigen (haplo +1) in the second HLA haplotype (3 cases) was used in the transplantation. In view of time considerations, typing was done only with respect to HLA-A, -B, and -C loci. Some of the determinations of HLA phenotypes were conducted personally by Professor P. Tarasaki (United States). DR antigen was also serologically identified. Donor bone marrow was obtained in an amount ensuring greater than or equal to 2 x 10^8 bone marrow cells per kg recipient body mass (on average, 1,100 +/- 200 ml). Three allogeneic bone marrow transplantations were performed against the blood group. Myelokaryocytapheresis with polyglucine was used to rid the donors of erythrocytes belonging to a different group.

In cases of transplantation of haploidentical bone marrow, the T-lymphocytes were removed from the transplantate (T-depletion) to prevent acute secondary disease. This was done by one of the authors of the method (Y. Reisner, Israel). To prevent acute secondary disease, methotrexate and/or cyclosporin A were administered in the accepted doses. After the haploidentical transplantations and the transplantation of human embryonal liver cells, antilymphocyte globulin was administered to prevent the rejection of this type of transplantate.

Six transplantations of human embryonal liver cells were also performed. Three transplantations were performed with cryoconserved cells from separate 12- to 18-week-old embryos obtained from Japan (at the request of R. Gale) from Professor Mugishima, and three were performed with live liver cells mixed from many embryos provided by the USSR Academy of Medical Sciences scientific center VONTs [not further identified](S. I. Whereshkov and K. L. Chimishkyan). Thus,

transplantations of truncal hematopoietic cells were performed on 19 of 25 patients who, in the first 7 to 9 days, were determined to have indications for this method of therapy. Six patients did not receive transplants: one patient with an absolutely hopeless prognosis, one because of the absence of a suitable donor, and four because of doubts as to the irreversibility of their myelodepression. The latter actually experienced restorations of their own hematopoiesis later.

After transplantation of human embryonal liver cells, all of the patients died of lesions to the skin and intestine between day 14 and day 18 after irradiation, with the exception of one 63-year-old woman (with a transplantation of human embryonal liver cells from an 18-week male embryo), who survived for 30 days following irradiation (a γ-irradiation dose to the bone marrow of 8.4 Gy). On the day of her death (day 17 after transplantation of human embryonal liver cells), many mitoses were detected for the first time against the background of profound pancytopenia in the bone marrow, with all of the cells having a female karyotype, i.e., her own bone marrow had begun to regenerate.

In an analogous manner, from day 2 to day 19 after allogeneic bone marrow transplantation (from day 15 to day 25 after irradiation), seven patients died of severe acute radiation lesions to the skin, intestine, and lungs.

Of the six who did not have such skin and intestinal lesions and who had a dose of total γ-irradiation estimated at between 4.4 and 10.2 Gy, two survived (γ-irradiation doses, 5.6 and 8.7 Gy). Both had haploidentical female donors (their sisters), and both completely rejected a partially functioning transplantate by day 32 to day 35 and had their own myelopoiesis restored beginning from day 28. Figure 8 presents the neutrophil curve and the dynamics of the karyologic data of one of them (patient T, who had a total γ-irradiation dose of 8.7 Gy). Four patients died between day 27 and day 79 after allogeneic bone marrow transplantation from mixed viral-bacterial infections. Two died against the background of a well-functioning HLA-identical transplantate (doses of total γ-irradiation, 7.6 and 6.4 Gy, respectively), and two died after early rejection (days 17 and 14) with haplo + 1 and haploidentical transplantates against the background of the restoration of their own myelopoiesis (doses of γ-irradiation, 4.4 and 10.2 Gy). There were explicit (two cases) or suspected (one case) signs of acute secondary disease (graft vs. host) or a transplantate rejection reaction (host vs. graft) (one case), which could have facilitated the development of fatal viral-bacterial infections. A retrospective analysis of the neutrophil content in all of those who survived the early period (> 27 days) after allogeneic bone marrow transplantation confirms the possibility of a reversible degree of myelodepression. In the two of them with the greatest irradiation doses (8.7 and 10.2 Gy), their own myelopoiesis was restored between 28 and 30 days after irradiation.

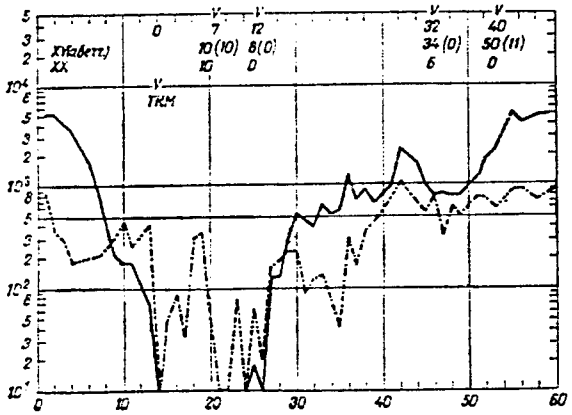

Figure 8. Dynamics of the number of neutrophils and lymphocytes in patient T with fourth-degree acute radiation sickness (-irradiation dose, 8.7 Gy) before and after bone marrow transplantation. *XY* and *XX* indicate the number of respective metaphases with a male and female karyotype detected in "direct" preparations of bone marrow; the numbers in parentheses indicate the number of male metaphases with postirradiation aberrations. The *x* axis above indicates the time before and after bone marrow transplantation (in days).

Thus, the survival of the transplantate during reversible myelodepression in two cases resulted in a lethal outcome because of the development of acute secondary disease, and the temporary incomplete survival of a haplo + 1 and haploidentical T-depleted transplantates may have facilitated an unfavorable outcome from infectious complications as a result of a rejection reaction (host vs. graft) or an occult reaction (graft vs. host). This hypothesis is confirmed by the fact that, among patients with at least an analogous dose of total γ-irradiation of the bone marrow on the order of 6.0 to 8.0 Gy but without any bone marrow transplantation, there was not one lethal outcome due to opportunistic infections after 30 days or more following irradiation.

All of the aforementioned confirms that in an accident situation similar to this one, the group of individuals for whom allogeneic bone marrow transplantation is indicated and for whom it may be successful is very limited.

Other problems related to non-bone-marrow lesions caused a grave course and lethal outcomes in the patients that we observed. We will devote a second communication to discussing them.

The authors express their thanks to the physicians and laboratory workers/hematologists who performed an enormous number of blood studies and to all of the physicians and nurses who provided direct treatment to the patients.

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UDC 577.391.2;51.001.57;519.21

Analysis of Survival Rate in Combined Radiation Exposure: Evaluation of Synergism (or Antagonism) in Two-Factor Exposure

18400183a Moscow RADIOBIOLOGIYA in Russian Vol 28 No 4, Jul-Aug 88 (manuscript received 11 Aug 86) pp 478-483

[Article by Ye. M. Myasnikova, A. Yu. Yakovleva, S. T. Rachev, Ye. I. Komarov, I. V. Remizova, R. S. Budagov and L. N. Chureyeva, Central Scientific Research Roentgeno-Radiological Institute, USSR Ministry of Health, Leningrad; Scientific Research Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk]

[Abstract] A statistical study was conducted to develop an approach to analyzing the effects of combined irradiation which, in its essential aspects, relied on a comparison of the survival data obtained with exposure to a single factor with that obtained with two-factor exposure. The comparative risk model [Gail, BIOMETRICS, 31: 209, 1975; Moeschberger and David, idem, 27: 57, 1971] was subjected to regression analysis [Cox, J. ROYAL STAT. SOC., Ser. B34: 187, 1972] to derive the regression coefficient β. At β> 0, a sygernism prevails between the two factors, and with β[h] 0, an antagonism. Experiments with outbred male rats (-194 g) challenged either with x-irradiation (10 Gy), intraperitoneal cytostatic dioxadet (4.5 mg/kg), or a combination of x-irradiation and (within 5 min) dioxadet yielded a regression conefficient of β = 0.07. The latter value indicated that both factors acted independently. In another study employing male and female Wistar rats (180-200 g) with thermal burns over 30 percent of body surface and 7.5 Gy gamma-irradiation, β was found to equal 0.82, demonstrating a synergistic effect. Figures 2; references 9: 2 Russian, 7 Western.

UDC 577.391.612.015.32

Effects of Parenteral Nutrition With Lipofundin and Infuzolipol on Lipid Metabolism in Rats With Pronounced Intestinal Symptoms Due to Radiation Injuries

18400405a Moscow RADIOBIOLOGIYA in Russian Vol 28 No 6, Nov-Dec 88 (manuscript received 23 Feb 88) pp 775-779

[Article by S. A. Stepanov, I. U. Yusupova and S. P. Grozdov, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] A comparative analysis was conducted on the effects of intravenous administration of two lipid emulsions to male, 190-210 g Wistar rats with intestinal symptoms due to 13.5 Gy x-irradiation of the abdominal area. The emulsions under investigation were lipofundin (B. Braun Melsungen; GDR), administered as a 20 percent preparation (0.75 ml), and infuzolipol (USSR), administered as a 10 percent emulsion in a volume of 1.5 ml on the 1st and 2d day of irradiation. Monitoring of lipid metabolism 72 h after irradiation showed that the lipid infusions did not lead to hyperlipemia, indicating that metabolic assimilation of the lipids proceeded essentially normally in the presence of profound intestinal disturbances. Determination of total lipids and their fractional composition in the brain, liver, heart, and remaining thymic tissue revealed that the infusions overcame an energy deficit and favored elevation of polyunsaturated fatty acids, desaturation, and synthesis of the longer acids. In general, infuzolipol was felt to be more beneficial in regulating lipid metabolism than lipofundin. References 9: 4 Russian, 5 Western.

UDC 577.391.612.111

Impact of Method of Erythrocyte Ghost Preparation on Their Radioresistance

18400405b Moscow RADIOBIOLOGIYA in Russian Vol 28 No 6, Nov-Dec 88 (manuscript received 15 Apr 88) pp 783-786

[Article by B. S. Fomenko and G. K. Dlimbetova, Institute of Biological Physics, USSR Academy of Sciences, Pushchino]

[Abstract] An analysis was conducted on the factors in the Dodge method of preparation of erythrocyte ghosts that affect the radioresistance of the final preparation [Dodge, J. T., et al., Arch. Biochem. Biophys., 100(1):119-130, 1963]. Fluorescent probes (1.8-ANS, pyrene) were used to analyze the effects of 1-10 Gy gamma irradiation from a Cs-137 source and 50-250 Gy irradiation from a Co-60 source on ghosts suspended in 150 mM KCl or 1/10 Dodge buffer at room temperature. Following irradiation the ghosts were kept at 37°C for 4 h. The results demonstrated that susceptibility to gamma irradiation could be controlled by the conditions employed for hemolysis. The relative radioresistance of the ghost preparations was enhanced by using 1 mM EDTA during hemolysis and subsequent one or two washings with the EDTA-free 1/10 Dodge buffer. The length of washing had no telling effect. However, maximum radioresistance was secured by washing with Dodge buffer containing EDTA. More detailed structural evaluations, reflected in the fluorescence spectra, are expected to provide clues as to the reasons for the differences in radioresistance. Figures 3; references 9: 1 Russian, 8 Western.

UDC 616.12-084+[378.661]+616.12-082

Organization and Initial Results of the Work of an Academic-Research-Clinical Association (Combining a Scientific Research Institute, VUZ, and Hospital) on Preventive Cardiology Problems

18400487 Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 61 No 1, Jan 89 (manuscript received 9 Oct 87), pp 55-57

[Article by A. N. Britov, A. K. Merzon, R. G. Oganov, V. N. Sofin, V. V. Kolomiyets, V. D. Gromenkov, All-Union Scientific Research Center of Preventive Medicine, USSR Ministry of Health; Department of Internal Medicine No. 3, Donetsk Medical Institute; City Hospital No. 3, Donetsk]

[Abstract] The decrees of the party and Council of Ministers on restructuring of education emphasize the need to create scientific-educational-production complexes (associations) to improve the practical training of future specialists. Especially sharply felt is the shortage of specialists in the field of preventive medicine. This article discusses the operation of an association that consists of the health ministry's Scientific Center for Preventive Medicine, the department of internal medicine No. 3 of the Donetsk Medical Institute, and the Donetsk City Hospital No. 3. Based on years of cooperation among these institutes, the association was created by a trilateral five-year agreement among the parties in September 1986. The center develops basic approaches to the prevention of hypertension in the population, improves and approve procedures for preventive cardiology, provides periodic training seminars for personnel from the other two institutions, and invites their participation in conferences, symposia, etc. The internal medicine department, among other things, develops specific programs of operation and trains interns in the procedures and techniques associated with actively preventing hypertension in populations affiliated with institutions and populations that are unaffiliated. The hospital ensures the implementation of a secondary hypertension prevention program in those populations. An anonymous questionnaire indicated that over 94% of persons involved in the association evaluated its work positively after a year of operation. The results of the first year of operation of the association confirmed the usefulness of such associations and the expediency of their organization throughout the country.

Physiologic Capabilities of Dogs in Searching for Mines and Explosives

18402036 Moscow VETERINARIYA in Russian No 2, Feb 89 pp 63-65

[Article by L. R. Plotvinova]

[Text] The experience of the Great Patriotic War [World War II] testifies to the successful use of dogs for detecting mines and explosives, particularly those in nonmetal casings, when searches with special devices—mine detectors—were difficult. However, neither the domestic nor the foreign literature contains any information about the physiologic capabilities of these animals when they are used for searching for mines.

Scholars note two types of spatial orientation of the animals' sense of smell: toward a moving scent source that leaves a trail of scent behind it and toward a stationary scent source. In other words, the objects being detected may be termed linear sources and point sources.

If an animal is able to use a scent trail to find the source being sought at an unlimited distance, the detection of point sources of scent is much more difficult.

Mines belong to the category of point scent sources. They are stationary, and their smell is found only above them.

The factors affecting animals' reaction to scent have been determined as a result of numerous experiments. The following may be stated with regard to dogs in the mine-sniffing service.

So-called time features affect the degree of animals' sensitivity to scents. For example, it is higher in the morning than during the rest of the day. Many years of observations have shown that the animals' highest olfactory activity is in July and March, with the lowest in December.

The direction of the olfactory activity of dogs is largely dependent on the features of the environment: it is lower in the forest than in open country.

Food also affects dogs' sense of smell: strong-smelling food (spices, smoked foods, etc.) diminish the quality of their sense of smell.

In dogs, sensitivity to smells is, to a large extent, dependent on climate, particularly on humidity, plus on factors related to human activity. For example, within the bounds of a population center, where there are many distracting stimulants, the animals' sense of smell is less keen.

The features of a dog's body also affect its sense of smell. According to data from a number of researchers, dark-colored animals show interest in a scent considerably longer than do light-colored dogs and can identify a scent from among a mass of other scents must faster.

It has also been established that the sense of smell is more delicate in females than in males.

The keenness of the perception of scents depends on the physiologic and "mental" state of the dog. Even a well-trained dog may show results that are below its capabilities if it receives physical punishment just before mine-sniffing work.

The features of the scent source itself are very important: its chemical composition (indole speeds respiration, heliotropin slows it), physical condition (gaseous sources release more scent particles than do solids), and its strength (dogs sometimes fail to pick up scents that are too weak).

Thus, mine-sniffing dogs must have a very keen, delicate sense of smell in order to be able to pick out the sought-for scent from among the many smells in the environment.

A mine is a complex stimulant. It has a shape, volume, color, and scent. But since a mine or explosive charge is placed in the ground at some depth and is well masked, the principal factors affecting the dog are various scents—such as that of the explosive or the mine casing, or the scents left by the person laying the mine—and the changes that are made in the location when the explosive is planted.

Animals perceive signals from various objects in the environment via several channels at once: optical, acoustic, chemical, etc. As a result of this, it has become necessary to study the physiologic capabilities of dogs and the degree of their importance to the process of searching for mines and explosives.

Complicated forms of animal behavior (in this case, dogs sniffing for mines and explosives) may be considered a manifestation of elementary reasoning activity. Many researchers have studied this topic at different times.

Experiments have established that a dog trained to search for one type of mine will also find other types that have been placed in a sector of a mine field if well-trained. That confirms the presence of analytical capabilities in mine-sniffing dogs: they not only memorize the complex properties of specific mines, but are also capable of responding, via association, to types that they have not yet encountered.

Research on the physiologic capabilities of dogs searching for mines and explosives was conducted on a group of mine-sniffing dogs.

The experiment used clinically healthy, even-tempered, active females of the eastern European sheep dog (German shepherd) breed who had higher nervous activity and were 1.5-2 years old.

The detection of a wooden block is probably related to the fact that the dogs reacted to a change in the scent of the soil that occurred when the soil was disturbed.

Another series of experiments ascertained the possibilities of using dogs to find mines and explosives when their vision and sense of smell were "turned off."

The animals' vision was "turned off" in the following manner. A 1% solution of atropine sulfate was dropped into both eyes of one dog. Another dog (the control) received drops of distilled water. After 30 minutes, the visual response of both dogs was checked. Without making any noise, a researcher dropped finely cut pieces of white paper from his raised hand 2 m in front of the dogs. The dog that was capable of seeing (the control) followed the paper's fall with interest. The animal that had the atropine applied to its conjunctiva paid no attention to the falling paper.

Mine fields were laid in a plot of land unfamiliar to the dogs. A PMD-6 mine, a 200-gram TNT demolition block 200 g, the same charge encased in polyethylene, a wooden casing from a PMD-6 mine, and a wooden block the same size as the mine casing were placed in the field at regular intervals. The objects were placed at a depth of 10 cm and were carefully masked with a layer of soil.

A handler directed the dog on a long leash to search for the objects, and an observer recorded the features in the animal's behavior.

The purpose of the first series of experiments was to determine the percentage of detection by the mine-sniffing dog of each of the buried objects under ordinary conditions. The experiments were conducted at different times of the year to derive average indicators. In all, 180 experiments were conducted. Table 1 presents the results.

Table 1.
Detection of Various Objects by Mine-Sniffing Dogs

Object	Detected		Not Detected		Questionable Results	
	No.	%	No.	%	No.	%
Mine shell	104	57.7	56	31.1	20	11.2
TNT demolition block	136	75.5	36	20.0	8	4.5
Wooden block	44	24.4	124	69.0	12	6.6
TNT charge in polyethylene	96	53.3	68	37.7	16	9.0
PMD-6 mine	164	91.1	16	8.9	—	—

The dogs' detection of the TNT charge in polyethylene was most interesting. Polyethylene impedes scent particles to a great extent. Considering the fact that the dogs were led to search for the objects 15-20 minutes after the objects were buried, there was virtually no scent of TNT. The animals found the charges encased in polyethylene in 53.3% of the cases. A more detailed analysis of the results showed that in winter, before the snow melted (from January to the middle of March) the dogs clearly detected the TNT charges in the polyethylene in 62.5% of the cases, whereas from April through August they detected it 37.5% of the time.

Thus, a higher percentage of detection of the TNT charge occurs in the winter. This is related to the fact that, in a negative environmental temperature, polyethylene creates a unique sound. The dog perceives it and, after becoming interested in it, digs up the snow.

Objects were placed in the experimental mine field in the following order: the PMD-6 shell (point No. 1), the TNT demolition block (No. 2), the wooden block (No. 3), the TNT charge encased in polyethylene (No. 4), and the PMD-6 mine (No. 5), and both dogs were led to the field.

Compared with the preceding day, the control dog went through the field confidently. The experimental dog proceeded very cautiously and took greater care than usual to familiarize herself with the smell, especially in the beginning.

This test showed that animals with their vision "turned off" spent more time searching for the objects (compared with the preceding day). They gradually adapted to the conditions of the blind search, and their movement about the plot of ground became more confident and quicker.

To study the behavior on the experimental mine field of dogs whose sense of smell had been "turned off," a 2% solution of Novocain was administered intranasally to the experimental dog 30 minutes before she went through the plot of ground. The control dog received drops of distilled water. Afterward, the handlers got the dogs to play, during which time the handlers hid behind a screen when the dogs weren't looking.

The dog whose sense of smell was "turned off" ran about the plot of ground where she had last seen her handler, but, not being guided by smell, she did not find the handler until he called her. The control dog easily found her handler by his scent trail, retracing his route exactly.

The objects were placed in the mine field in the same order as in the previous experiment. The results of the dogs passing through the experimental mine field showed that the search of the dog whose sense of smell was "turned off" was significantly worse than on the preceding day. She found the mine casing only. She indicated the location of the charge in the polyethylene less than confidently (this result was considered questionable), and she could not find the other objects.

The nature of the search was also changed: the dog was tense and nervous while she worked. The day before, she

had been calm, had found the mine and the TNT charge with confidence, and was uninterested in the other objects.

The control dog (by comparison with the preceding day) worked with no appreciable change in its search behavior.

The following experiment was conducted to determine the nature of a search in which the animals made multiple passes over one and the same mine field. In a plot of ground measuring 100 x 6 meters, various types of mines were placed in the soil and camouflaged, and the dogs were directed to search for them.

Some 10-15 minutes after the animal made her first pass through the field, she was was again led to the same field. This was repeated several times. The dog's search was timed and her search behavior observed simultaneously. Table 2 presents the results of this experiment.

Table 2.
Results of Work With a Mine-Sniffing Dog With Multiple Passes Through the Field

Pass No.	Search Time	Nature of Search Behavior
1	5 min 07 s	Active search; mines sought carefully; distinct zigzag; all objects detected
2	4 min 32 s	Active search; search performed with interest; weak zigzag pattern; all objects detected
3	1 min 20 s	No zigzag pattern; dog moves from mine to mine, without searching space in between mines
4	1 min 04 s	Dog stopped at beginning of field, looked around, and went from on e mine to the other

It follows from this that, initially, the dog primarily used her sense of smell (she was getting accustomed to the scent). After that, she relied mainly on her vision in finding the objects, manifesting elements of reasoning activity.

Thus, the behavior of dogs when searching for mines and explosives may be viewed as complex and goal-oriented.

Dogs whose vision is "turned off" search more carefully, but it is not feasible to resort to this method as a means of improving search efficiency, since deprivation of vision or the sense of smell causes a sharp reduction in the tonus of the cerebral cortex, and the dogs adapt poorly to the new conditions of their existence, with their main state being prolonged sleep (up to 23 hours a day). The activity of their internal organs is also sharply depressed.

The search of dogs whose sense of smell has been "turned off" is distinguished by nervousness and lack of confidence. Such animals have difficulty finding objects and frequently make mistakes in their choice.

Reasoning activity plays a definite role in the process of a dog's search for mines and explosive charges.

UDC 619:615.371:636.5

Experimental Evaluation of Powder Vaccine Against Newcastle's Disease

18400403 Moscow VETERINARIYA in Russian No 11, Nov 88 pp 34-35

[Article by R. G. Mavlikayev, A. T. Kushnir, Ye. M. Khripunov, S. D. Yevseyeva, A. P. Koltsov, O. N. Ivanov, Yu. G. Yushkov, All-Union Scientific Research Institute of Veterinary Virology and Microbiology]

[Abstract] An aerosol method using lyophilized vaccines of the B_1 and La-Sota strains is widely used to vaccinate birds against Newcastle disease. The method is economical and has good immunologic effect, but the vaccine is largely inactivated in the process of dispersion in the air. The use of live vaccines in powder form, with the vaccine virus sorbed onto the surface of solid particles, can eliminate such a shortcoming. This article describes a study to determine an effective and suitable carrier for that purpose. Hydrophilic aerosil (SiO_2) with particle diameter 4-40 nm was selected, and it was found that a dose of 1000-1200 EID_{50} was effective for birds 10-30 days old. The vaccine did not become inactive in air.

UDC 619:616.981.42:576.807.7

Experience With Indirect Hemagglutination Test in Brucellosis

18400459b Moscow VETERINARIYA in Russian No 1, Jan 89, pp 60-62

[Article by S. G. Khairov and O. Yu. Yusupov, Caspian Area Zonal Veterinary Scientific Research Institute]

[Abstract] The agglutination test, complement-fixation test, extended complement-fixation test, and the rose bengal excretion test cannot, when used individually, identify all cases of animal brucellosis, which means that several tests must be used simultaneously. In terms of the development of methods that are more sensitive and more accessible to veterinary practice, the indirect hemagglutination test is promising. This test was compared with the other tests under experimental and production conditions in the examination of 26,531 cattle blood serum specimens and 29,508 specimens from sheep. The test was found to be highly specific and sensitive, allowing timely diagnosis and identification of animals with brucellosis at an earlier time and with more complete accuracy than the tests which are now officially recommended. The indirect hemagglutination test is valuable for quick analysis, because it produced clear results, is easy to use, requires no expensive equipment, and takes 3-4 hours.

UDC 576.893.192.6:895.771:591.67

Susceptibility of Entomopathogenic Virus-Infected Aedes Aegypti Mosquitoes to Plasmodia

18400410b Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6, Nov-Dec 88 (manuscript received 17 Mar 88) pp 18-22

[Article by I. F. Zakharova, L. A. Ganushkina, Yu. V. Chernov, L. M. Chunina, V. Ya. Yakubovich and V. V. Yasyukevich, Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health]

[Abstract] In order to assess the potential usefulness of insect viruses in the control of malaria, a study was conducted on the effects of densonucleosis virus on the sporogony of Aedes aegypti. Evaluation of the survival and histologic data demonstrated that the presence of the parvovirus in question had no telling effect on the susceptibility of the female mosquitoes to Plasmodium gallinaceum, nor on the development of the plasmodium. In fact, ultrastructural studies failed to reveal the virus in the oocysts and sporozoites of P. gallinaceum. Despite the histopathologic changes and reduced viability of the female mosquitoes due to infection by densonucleosis virus, their function as vectors of the malaria parasite appears not to have been impaired. Figures 1; references 18: 9 Russian, 9 Western.

UDC 578.833.28:578.427]:576.895.771:591.67

Phenotypic Differences in West Nile River Virus After Replication in Two Tissue Cultures Derived From Aedes Albopictus Skuse, 1895

18400410d Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 6, Nov-Dec 88 (manuscript received 10 Mar 88) pp 78-81

[Article by V. N. Lyapustin, S. P. Chunikhin, I. A. Reshetnikov, T. S. Gritsun and V. A. Lashkevich, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] An analysis was conducted on the outcome of infection with West Nile fever virus B-956 of two cell cultures derived from Aedes albopictus. In the case of infection of a cloned cell culture (C 6/36) extensive cytopathology and destruction of the monolayer was evident in 5-7 days. Infection of an uncloned cell line did not evoke cytopathic sequelae. Immunoelectrophoretic studies demonstrated that the virions formed in the C 6/36 cells contained E, C and M proteins with MWs of 49, 14.5 and 9 kD, respectively. Virions produced in the uncloned cell strain possessed only a shorter E protein with a MW of 45 kD and greater electrophoretic mobility. The latter virions were far less stable and may be a factor in limiting the circulation of the West Nile fever virus in nature. References 18: 5 Russian, 13 Western.

UDC 578.833.31:[578.427:576.895.42

Solid-Phase Immunoassay Indication of Antigen of Crimean-Congo Hemorrhagic Fever (CCHF) Virus in Tick Vectors

18402014f Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 1 Apr 88) pp 69-71

[Article by S. Ye. Smirnova, A. G. Sedova, Yu. V. Zimina and A. S. Karavanov, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] A comparative analysis was performed on the detection of CCHF indicator antigen in tick vector (Hyalomma marginatum marginatum), male and female specimens, by solid-phase immunoassay and fluorescent antibody technique. The former method was found to be extremely sensitive, identifying 30 samples as antigen positive out of a total of 83; whereas the latter technique yielded 7 positives out of 42. In a few of the cases that were positive by the solid-phase immunoassay further corroboration was obtained by virus isolation from ticks isolated from sheep and soil in an endemic area. The broad applicability of the solid-phase immunoassay to male and female ticks and laid eggs for the detection of CCHF antigen demonstrated the usefulness of this method in endemic regions. Figures 1; references 6: 3 Russian, 3 Western.

UDC 616.98:578.833.2]-022.1-092.036.8

Experimental Karshi Virus Infection in Monkeys and Laboratory Animals

18402014g Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 15 Apr 88) pp 71-74

[Article by I. I. Terskikh, L. N. Abramova, N. S. Savosina, V. L. Gromashevskiy and D. K. Lvov, Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow]

[Abstract] Extensive studies were conducted on the pathology of Karshi virus LEIV2247, originally isolated in Uzbekistan from the tick Ornithodorus papillipes, using various routes for the infection of albino mice, Syrian hamsters, and green monkeys. The virus was demonstrated to possess pantropic predilections, with particular affinity for the CNS that leads to meningoencephalitis and marked pathologic changes in the hippocampus. Mice were found to be the most susceptible species to the Karshi virus, while monkeys eventually responded with an antibody response. The virus spread

via the hematogenous route. Additional studies demonstrated that chick embryos show a 70 percent mortality rate 5-7 days after injection of the virus into the yolk sac and may serve to propagate the Karshi virus since it was readily recovered from the allantoic fluid and the yolk sac membranes. References 4: 3 Russian, 1 Western.

All-Union Seminar on Lasers in Biology and Medicine

18400576c Tallinn SOVETSKAYA ESTONIYA in Russian 2 Jun 89 p 3

[Article by N. Grigoryeva]

[Excerpt] Everything about lasers in biology and medicine—the topic of an all-union seminar which has been held in Kyaeriku could perhaps be summed up briefly in these words. For 3 days, medical specialists, physicists, biologists and electronics specialists talked about ways of helping medicine transfer to the use of laser technology in clinical practice on a broad scale.

Papers which were read and presented at the seminar by specialists of Moscow, Leningrad, Kiev, Novosibirsk, Tbilisi, Minsk, Odessa, Tallinn, Tartu and other cities gave a detailed picture of the use of lasers in ophthalmology and heart surgery and, most importantly, in the prevention of cardiovascular diseases and treatment of acute infarct.

Another very important feature of the seminar was that it demonstrated that research of scientific principles of laser radiation's interaction with living cells is characteristic of the present time.

Summarizing results of the seminar, Doctor of Technical Sciences M. Stelmakh, head of a chair of instruction of a physical-technical institute, said: "I think that successes in this field, together with achievements of laser technology, will have truly revolutionary effects in our medicine and biology."

The latest scientific gathering in Kyaeriku was the second of its kind; the preceding one took place last year. It has been decided to hold such seminars regularly from now on, and not without reason, since this scientific direction is receiving special attention at Tartu University and the Estonian Academy of Sciences' Institute of Physics. Moreover, work of Tartu physicists and medical specialists is known far beyond the republic's boundaries.

FTD/SNAP

Development of Neurocomputers

81440643 Moscow KRASNAYA ZVEZDA in Russsian 28 Dec 88 p 3

[Article by Rear Admiral Ye. Buzov, winner of the Lenin Prize, under the rubric "In the Laboratories of the World": "Neurocomputers. What Are They?"; first paragraph is KRASNAYA ZVEZDA introduction]

[Text] When developing computers, people always dreamed of such devices, which would solve perfectly and at a high speed not only difficult mathematical, but also logical problems, teach themselves, recognize patterns of a different physical nature, design, and even invent. What once seemed fantastic is today acquiring real forms. Confirmation of this is the discussion on the pages of the world press of the results of studies of neural networks, which were the basis for the development of a computer, which functions on the principles of the working of the brain, or a neurocomputer.

The term "neurocomputer" thus far has not become official, although this concept itself is connected with the sphere of the application of the neurosciences to the problem of information processing. Without laying claim to the strictness of the formulations, it is possible to say: a neurocomputer is a technical device, for which a model of the neural network for the solution of problems of artificial intelligence has been made the basis. In other words, a device, which operates according to the principle of the human brain, is being developed on the basic of "artificial neurons."

The neuron is the most unique creation of nature. Its amazing peculiarity is that through numerous short fibers—dendrites—it receives information and transmits this information, which has been processed in some specific manner, as nerve impulses to other neurons through a single long fiber—an axon. The neuron is a system with a large number (several thousand) of inputs and a single output. The external membrane of the neuron is capable of generating nerve impulses and transmitting information from one neuron to another.

The human brain consists of 15 billion neurons. This is approximately the same as the number of stars in our galaxy. Each neuron can be connected with thousands of others. Fundamentally new methods of research, new systems of concepts, and fundamentally new approaches to the study of the brain at the level of the understanding of the overall control of it as a most complex system are needed in order to understand how these immense and unique groups of neurons and the brain as a whole work and how the processing of the information, which is received from the sense organs, takes place.

A special element, which is developed on the basis of a model of the neuron and is some device with a large number of inputs and a specially organized output, should be basic in such computers. While a variable connection between these elements should be the main principle of their interaction.

Whereas a conventional digital computer processes information sequentially, uses strictly binary code, and performs complex mathematical computations accurately and quickly, the brain processes information in millions of channels with a significantly slower speed. It uses less accurate methods of signaling with allowance made for past experience and, in addition to solving complex mathematical problems, is capable of recognizing imagines, which a computer is incapable of doing. Let us add: our brain supports normal functioning when solving intellectual problems even in case of the death of a significant number of neurons, while in a computer in case of the failure of elements of the machine all computations are disrupted.

A curious fact. The Japanese firm Fujitsu developed a neurocomputer which processes information that is comparable to what 100,000 neurons are capable of processing. Meanwhile, modern supercomputers can perform operations in amounts which are characteristic of the possibilities of only six neurons of the brain.

What are the potentials of future neurocomputers? First of all one should speak about the recognition of patterns (various graphic symbols—printed and handwritten, photographs or television pictures, people and objects). Wave processes (the spectra and sonograms of many physical phenomena), acoustic signals, seismic waves, and electrical or other signals, which describe the state of a person (for example, electrocardiograms and electroencephalograms), are also grouped with patterns.

The creation of artificial neural networks is affording a thrilling prospect in the development of an intelligent neurocomputer. Such a device will be able to teach itself (without any quotation marks) in accordance with laws that are close to the human brain, to think logically, to comprehend spoken language, and to provide written printouts.

By teaching themselves, accumulating a significant data bank, having a high speed of retrieval of the needed information, and ensuring the descriptive analysis of information, neurocomputers of the future will probably be able to develop hypotheses, to make original generalizations, to recognize and analyze what is happening, and to present it in the form that the operator or user needs. As we see, the opportunity to work without so-called software, by elaborating a final solution on the basis of different versions of its "thought" activity, appears in the neurocomputer.

Such computers will be capable of not only elaborating solutions in the most difficult and even unforeseen situations, but also synthesizing knowledge with little assistance of man or without him.

Now existing computers are characterized by specific parameters, in accordance with which it is possible to compare them with each other. For neurocomputers the criteria of comparison have not yet been elaborated. However, it is possible to assume that the neuroparameter (let us provisionally call it this), which should

characterize the number of neuron-like elements that are incorporated in the computer, will be one of them. Another characteristic is the number of connections between the neuron-like elements and the information processing speed.

The American firm HNC characterizes its general-purpose neurocomputer (ANZA) by the following data: the number of neuron-like elements—30,000, the number of connections between them—300,000, the information processing speed—25,000 connections a second. The press has also reported on a more "powerful" neurocomputer of the firm TRW (250,000 neuron-like elements with 5.5 million connections between them) and on the plan to develop a system with 100 million neuroelements.

It should be noted that success in the development and introduction of neurocomputers involves the need to assimilate fundamentally new semiconductor technologies and to expand research in the field of neurobiophysics. The number of scientific publications, seminars, and conferences testifies to the scale of the basic and applied work which is connected with this direction. The first international conference on neural networks, in which hundreds of specialists participated, was held in 1987 in San Diego (the United States). The world congress in Budapest brought together thousands of delegates.

The definite rivalry of Japanese, American, and European companies in research on neural networks and neurocomputers has emerged. Western specialists believe that in 5 years neurocomputers will begin to be used extensively in practice. The basic results in the theory of the brain, which have been achieved by scientists, and the combining of the efforts of physicists and specialists in information processing, neurobiology, and electronics are a guarantee of success.

The key feature of the theory of neural networks and neurocomputers is the body of mathematics, by means of which the choice and optimization of the architecture of the neurocomputers being developed are carried out. Such important sections of mathematics as the theories of probability, fuzzy (diffuse) logic, Markov random processes, operation research methods, and statistical physics, belong here. This list shows the complexity and "universal" peculiarity of the theory of neurocomputers.

However, in spite of the complexity and manysided nature of the problem, it is necessary to acknowledge as an objective reality the appearance of a fundamentally new scientific direction, having stressed its revolutionary essence. This direction is capable of ensuring a breakthrough in the area of information science and in the development of thinking computers.

UDC 614.449.57:576.895.2

Combined Methods for Controlling Medically Important Arthropods

18402014a Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan 89 (manuscript received 8 Apr 88) pp 3-9

[Article by A. N. Alekseyev and M. N. Kostina, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] A review is presented of combined control methods for medically significant arthropods through the use of bioactive agents (BA) and biological control techniques. The basic premise for the use of such combinations rests on the documentation that such an approach entails less chance of development of arthropod resistance, both against the individual agents and their combinations. In addition, a combined approach facilitates selection of BA and biological factors that minimize risk to mammals and other non-target organisms and pose less of an ecological hazard in general. In addition, the use of combinations of BA and biological factors may cover a broader scope of ecological niches of the target arthropod, evidence synergistic effects, and be less expensive than the use of either factor alone. In case of resistance to a given chemical agent—such as DDT, hexachlorocyclohexane, organophosphorus compounds, carbamates, or pyrethroids—insect growth inhibitors and juvenile hormone analogs may often be employed. In addition, the protein toxins of Bacillus thuringiensis and B. sphaericus have been shown to be free of cross resistance with known chemical insecticides. On balance, the appropriate combinations offer the key advantages, in addition to lower dosages, of reducing the chance of putative adverse effects on mammals or on the ecosystem while targeting arthropod vectors. Figures 3; references 6: 5 Russian, 1 Western.

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Comparative Analysis of Methods of Capture and Maintenance of Ixodid Ticks

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[Article by G. S. Kislenko and Yu. S. Korotkov, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow]

[Abstract] Studies with the imago stage of the taiga tick Ixodes persulcatus demonstrated that moistened bandages 130 mm wide represented the optimum conditions for capture and maintenance of the ticks. Ticks recovered from the bandages may be used immediately for experimental purposes because of the extremely low incidence of trauma and retention of full viability.

While the survival rate for ticks transferred to glass chambers for maintenance in a refrigerator is less than 5 percent after a month, the 50 percent survival rate for female and male I. persulcatus ticks on moist bandages was 25.0 and 20.3 days, respectively. Figures 1; references 14 (Russian).

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